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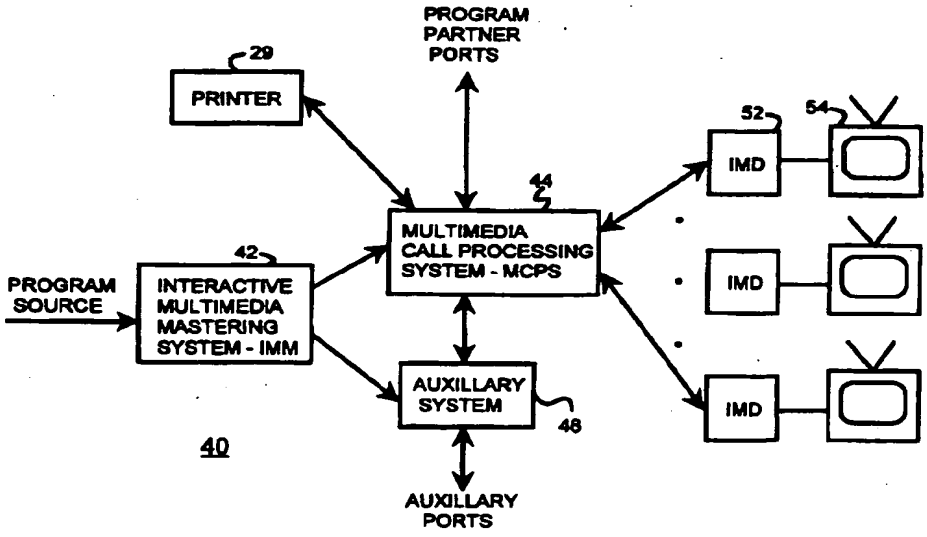
With international search report.

(54) Title: COUPONING ISSUANCE AND TRACKING SYSTEM FOR A COMMUNICATIONS NETWORK



(57) Abstract

A couponing issuance and tracking system (40) for use in an interactive multimedia transmission network is provided that includes a multimedia call processing system (44) that is responsive to program materials for providing multimedia information, and means (42) that are interactively responsive to the multimedia call processing system for controlling the flow of multimedia information to the multimedia call processing system (44). The issuance and tracking system also includes a plurality of interactive multimedia devices (52) (IMDs) for receiving and transmitting multimedia information to and from the multimedia call processing system (44) and printing means (29) responsive t the multimedia information from at least one of the plurality of IMDs (52) for generating coupons.

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FI	Finland	**ML**	Mali	**US**	United States of America
FR	France	**MN**	Mongolia	**UZ**	Uzbekistan
GA	Gabon	**MR**	Mauritania	**VN**	Viet Nam

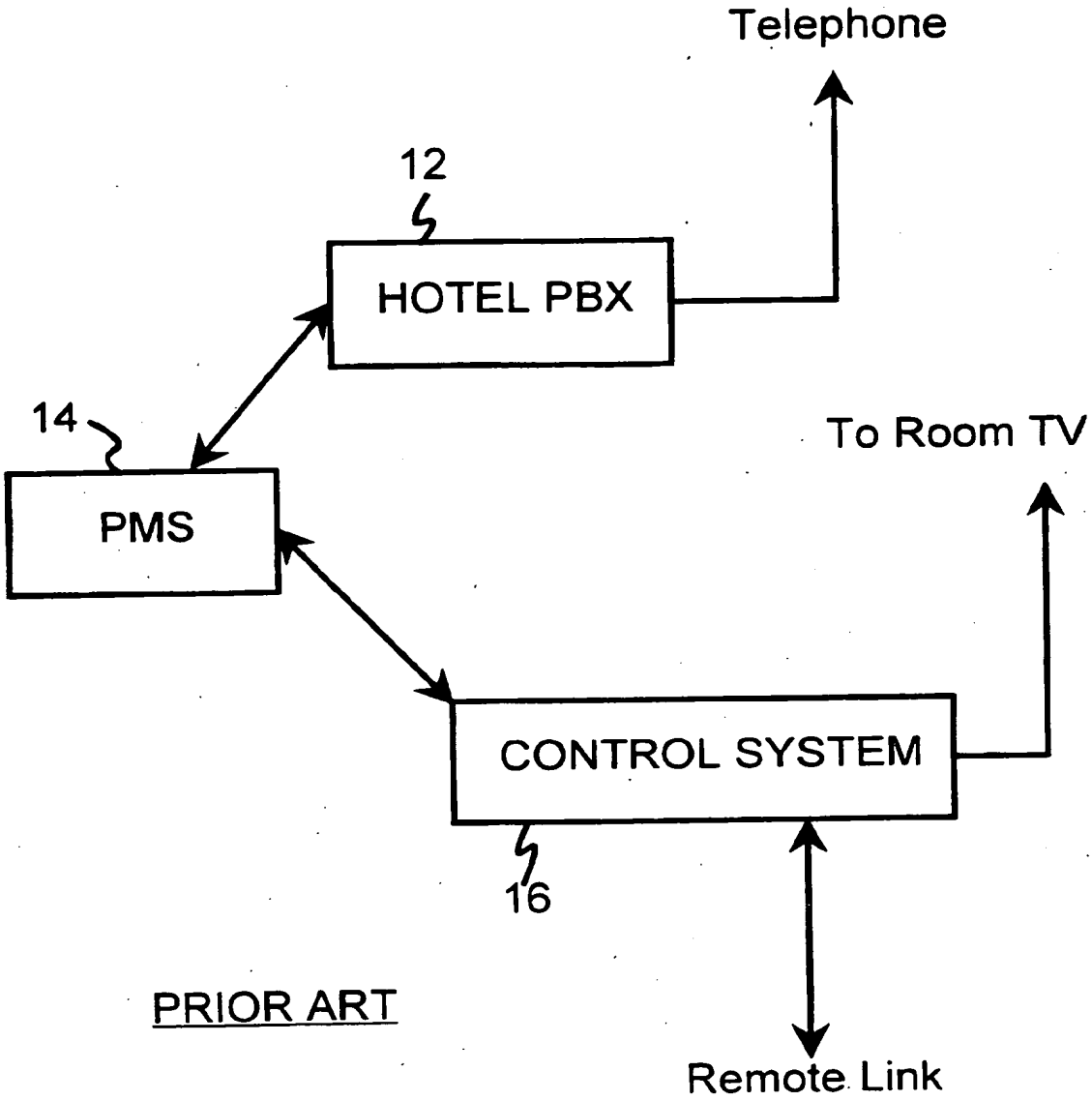

Telephone
12
HOTEL PBX
14
To Room TV
PMS
CONTROL SYSTEM
16
PRIOR ART
Remote Link

FIGURE 1

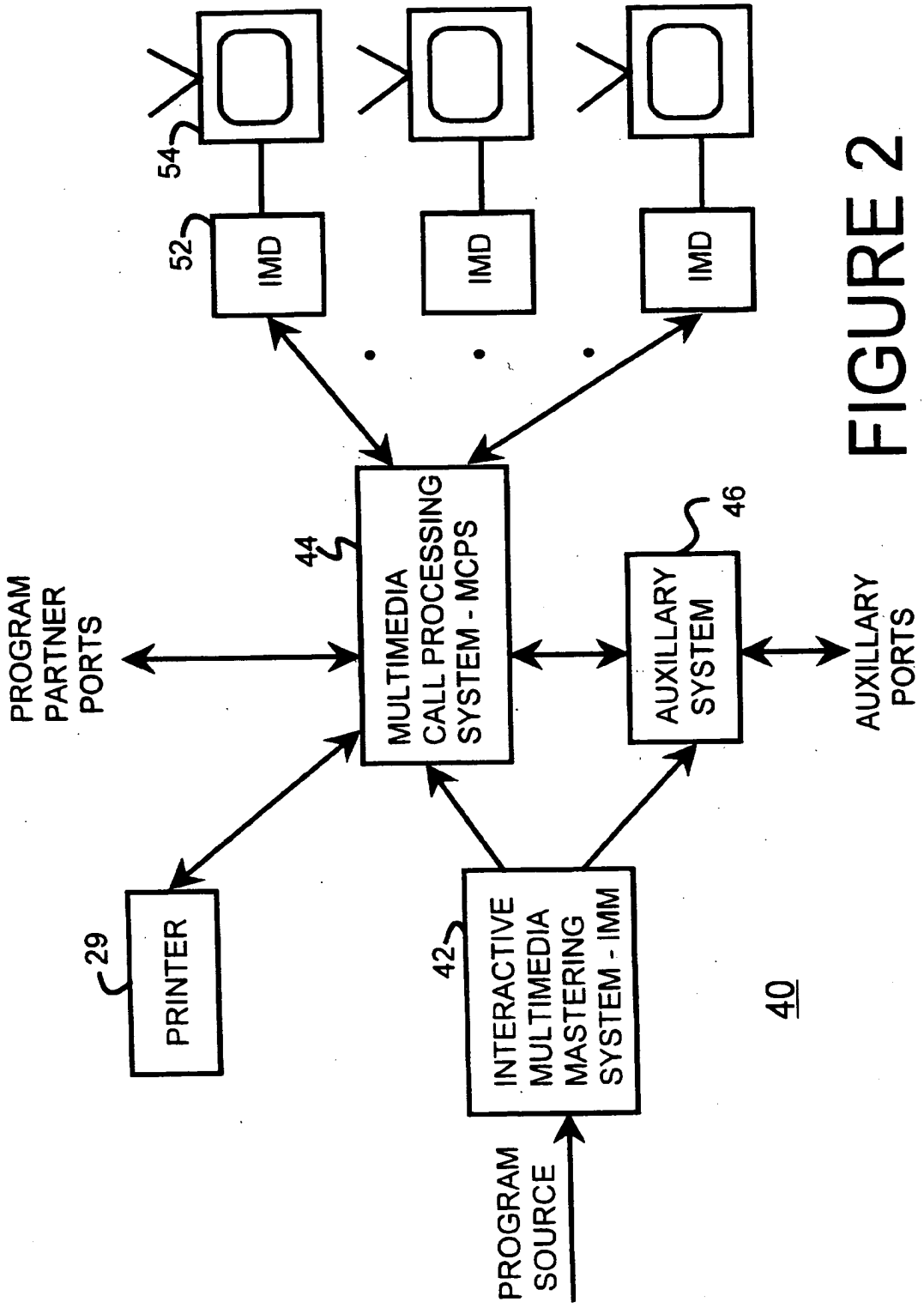

54
52
IMD
IMD
IMD
PROGRAM PARTNER PORTS
44
MULTIMEDIA CALL PROCESSING SYSTEM - MCPS
46
AUXILLARY SYSTEM
AUXILLARY PORTS
29
PRINTER
42
INTERACTIVE MULTIMEDIA MASTERING SYSTEM - IMM
PROGRAM SOURCE
40

FIGURE 2

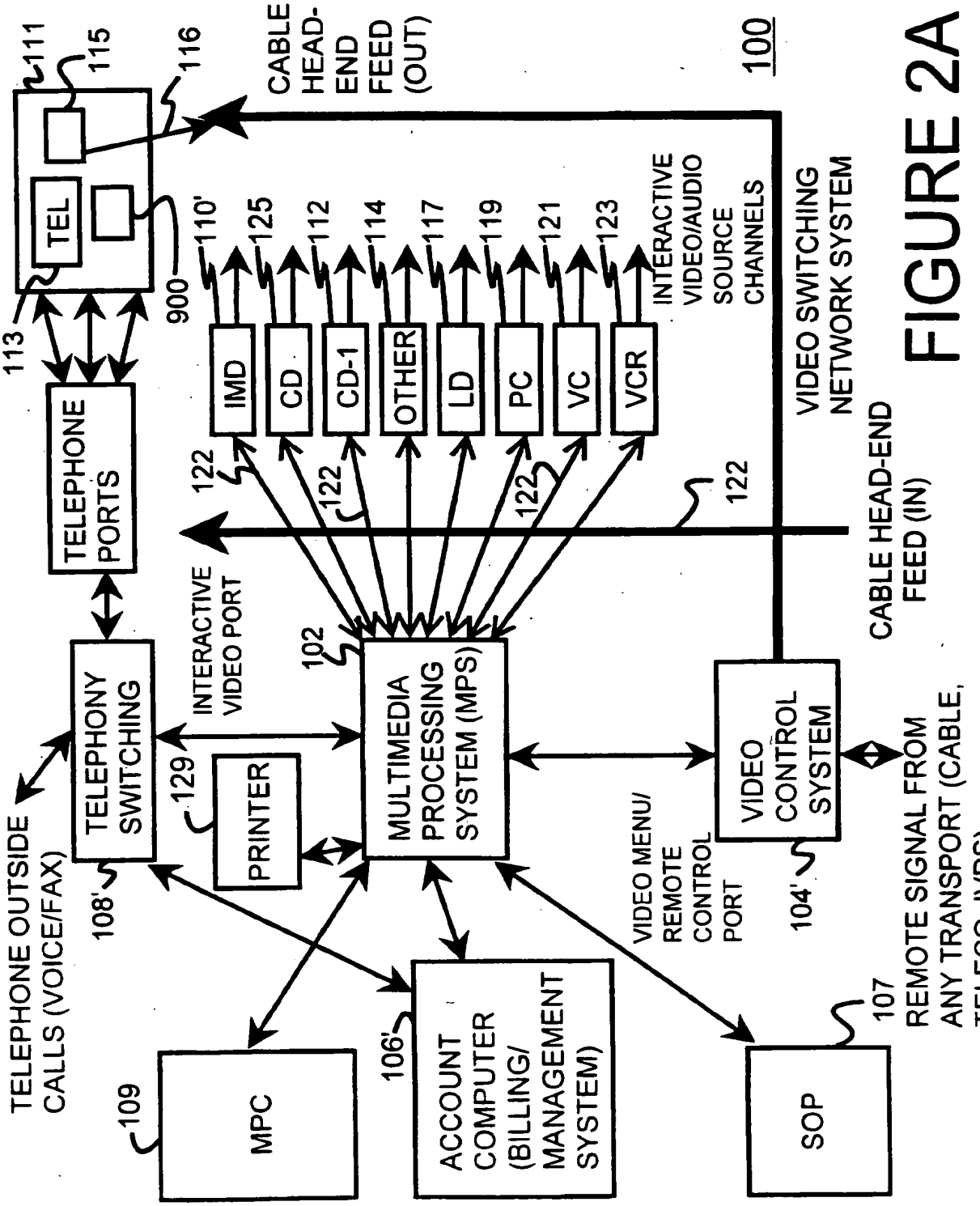
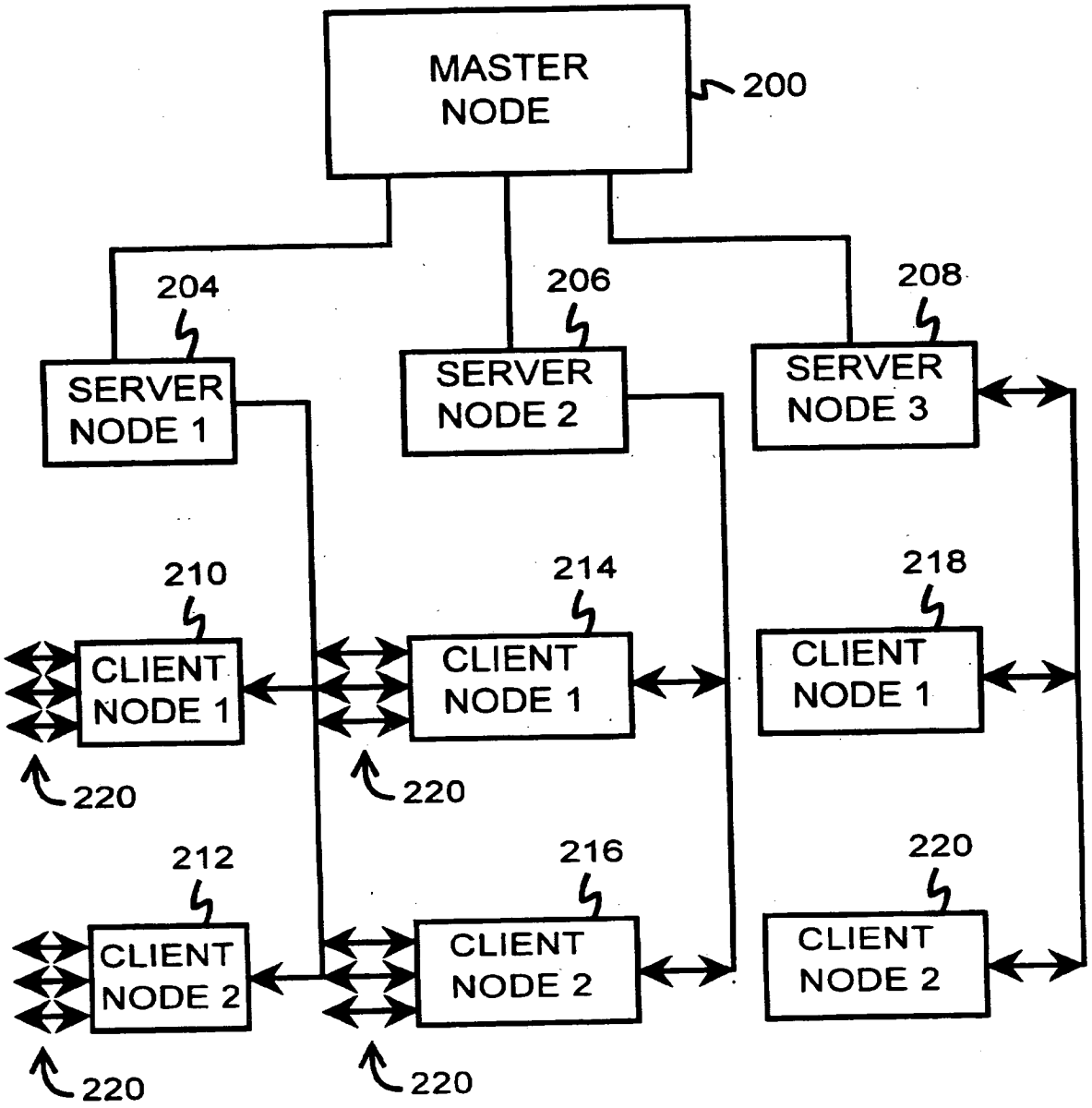

100
111
115
116
TEL
CABLE HEAD-END FEED (OUT)
113
900
110'
125
112
114
117
119
121
123
IMD
CD
CD-1
OTHER
LD
PC
VC
VCR
INTERACTIVE VIDEO/AUDIO SOURCE CHANNELS
VIDEO SWITCHING NETWORK SYSTEM
TELEPHONE PORTS
122
122
122
122
CABLE HEAD-END FEED (IN)
INTERACTIVE VIDEO PORT
102
TELEPHONY SWITCHING
MULTIMEDIA PROCESSING SYSTEM (MPS)
VIDEO CONTROL SYSTEM
129
PRINTER
TELEPHONE OUTSIDE CALLS (VOICE/FAX)
108'
VIDEO MENU/ REMOTE CONTROL PORT
104'
REMOTE SIGNAL FROM ANY TRANSPORT (CABLE, TELECO, IVDS)
109
MPC
106'
ACCOUNT COMPUTER (BILLING/ MANAGEMENT SYSTEM)
107
SOP

FIGURE 2A


MASTER NODE
200
204
206
208
SERVER NODE 1
SERVER NODE 2
SERVER NODE 3
210
214
218
CLIENT NODE 1
CLIENT NODE 1
CLIENT NODE 1
220
220
212
216
220
CLIENT NODE 2
CLIENT NODE 2
CLIENT NODE 2
220
220

102

FIGURE 3

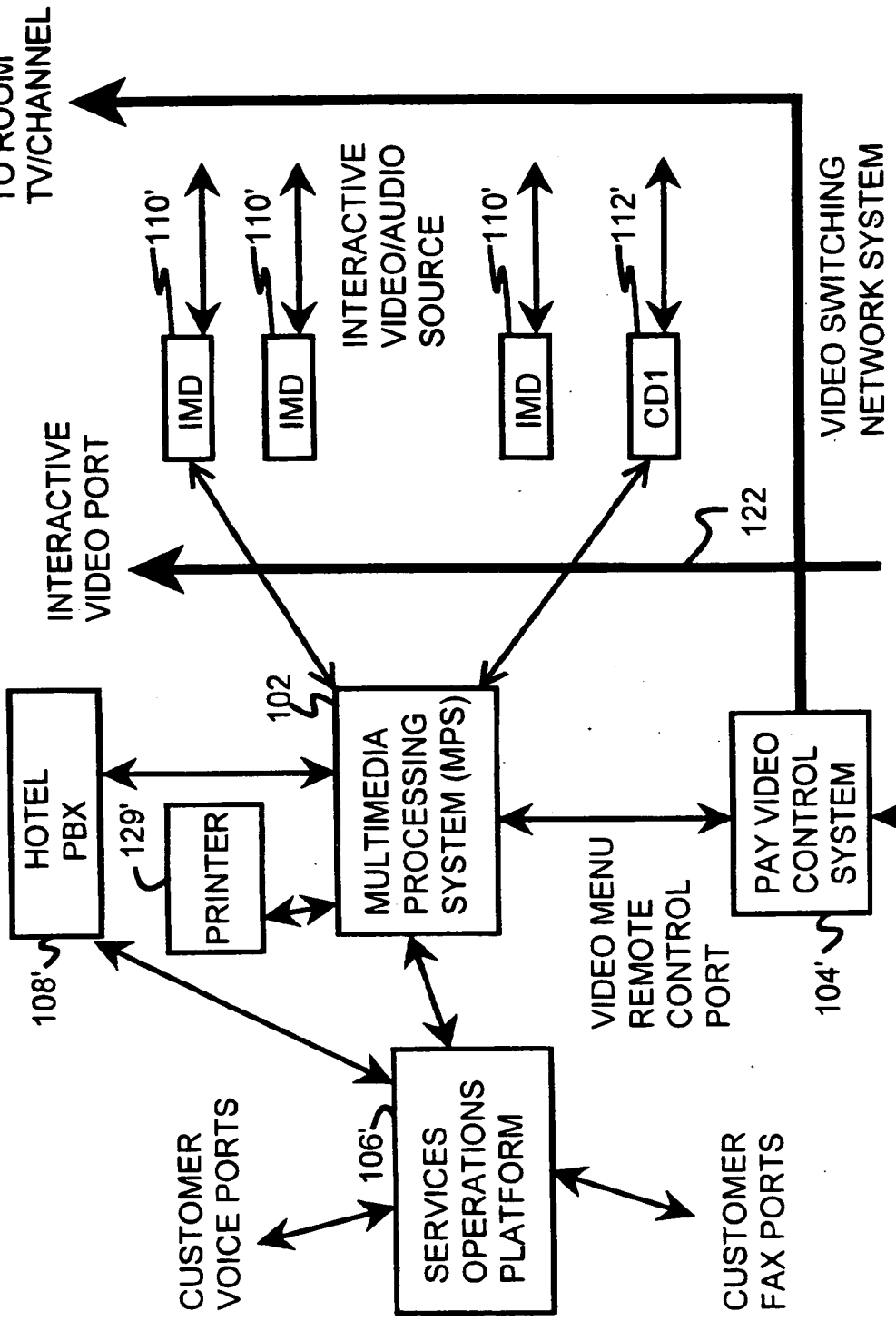

TO ROOM TV/CHANNEL
INTERACTIVE VIDEO PORT
IMD
110'
IMD
110'
INTERACTIVE VIDEO/AUDIO SOURCE
IMD
110'
CD1
112'
VIDEO SWITCHING NETWORK SYSTEM
122
102
HOTEL PBX
108'
129'
PRINTER
MULTIMEDIA PROCESSING SYSTEM (MPS)
PAY VIDEO CONTROL SYSTEM
104'
IN ROOM REMOTE LINK
VIDEO MENU REMOTE CONTROL PORT
CUSTOMER VOICE PORTS
106'
SERVICES OPERATIONS PLATFORM
CUSTOMER FAX PORTS

FIGURE 4

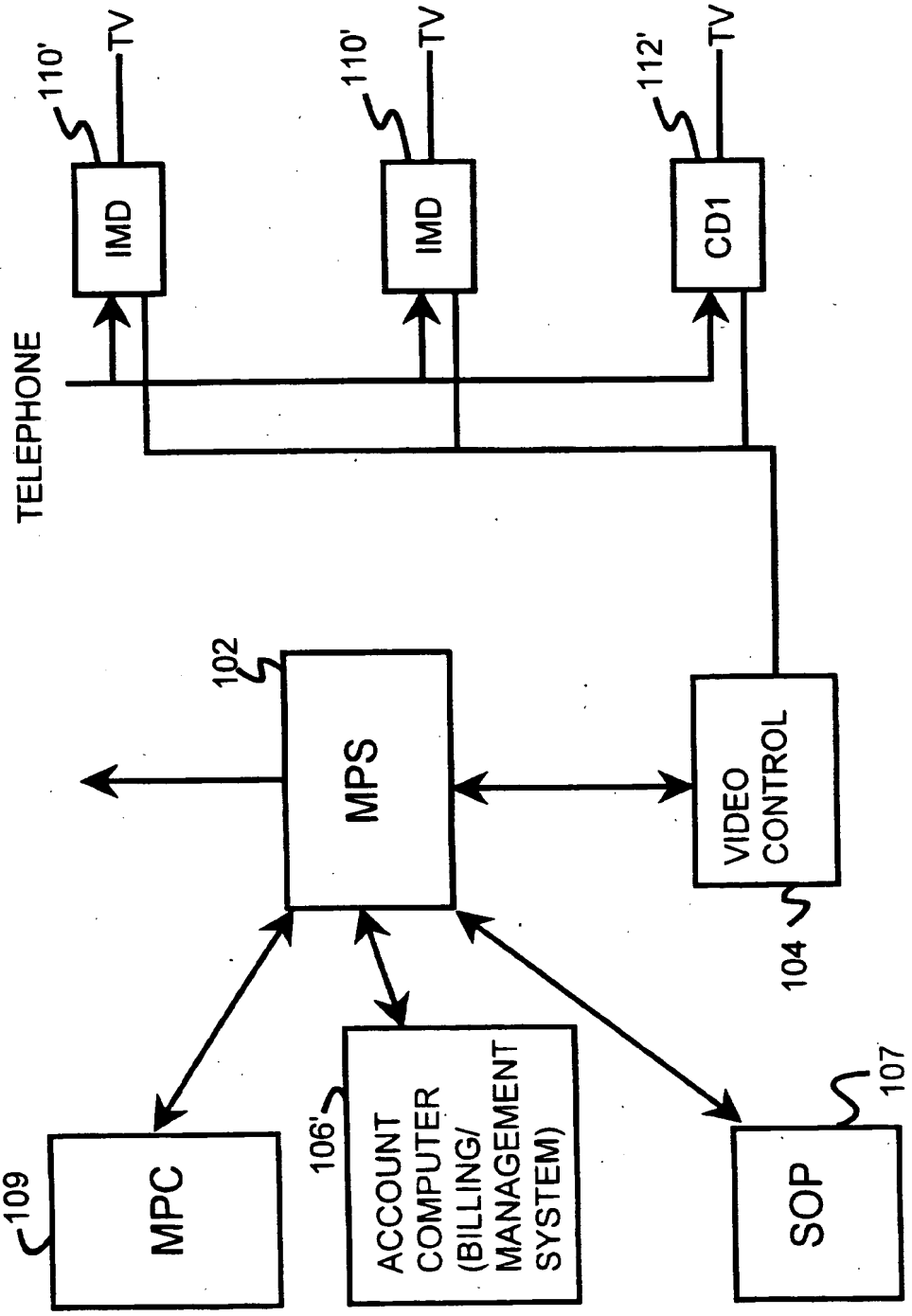

TELEPHONE
IMD
110'
TV
IMD
110'
TV
CD1
112'
TV
MPS
102
VIDEO CONTROL
104
MPC
109
ACCOUNT COMPUTER (BILLING/ MANAGEMENT SYSTEM)
106'
SOP
107

FIGURE 5

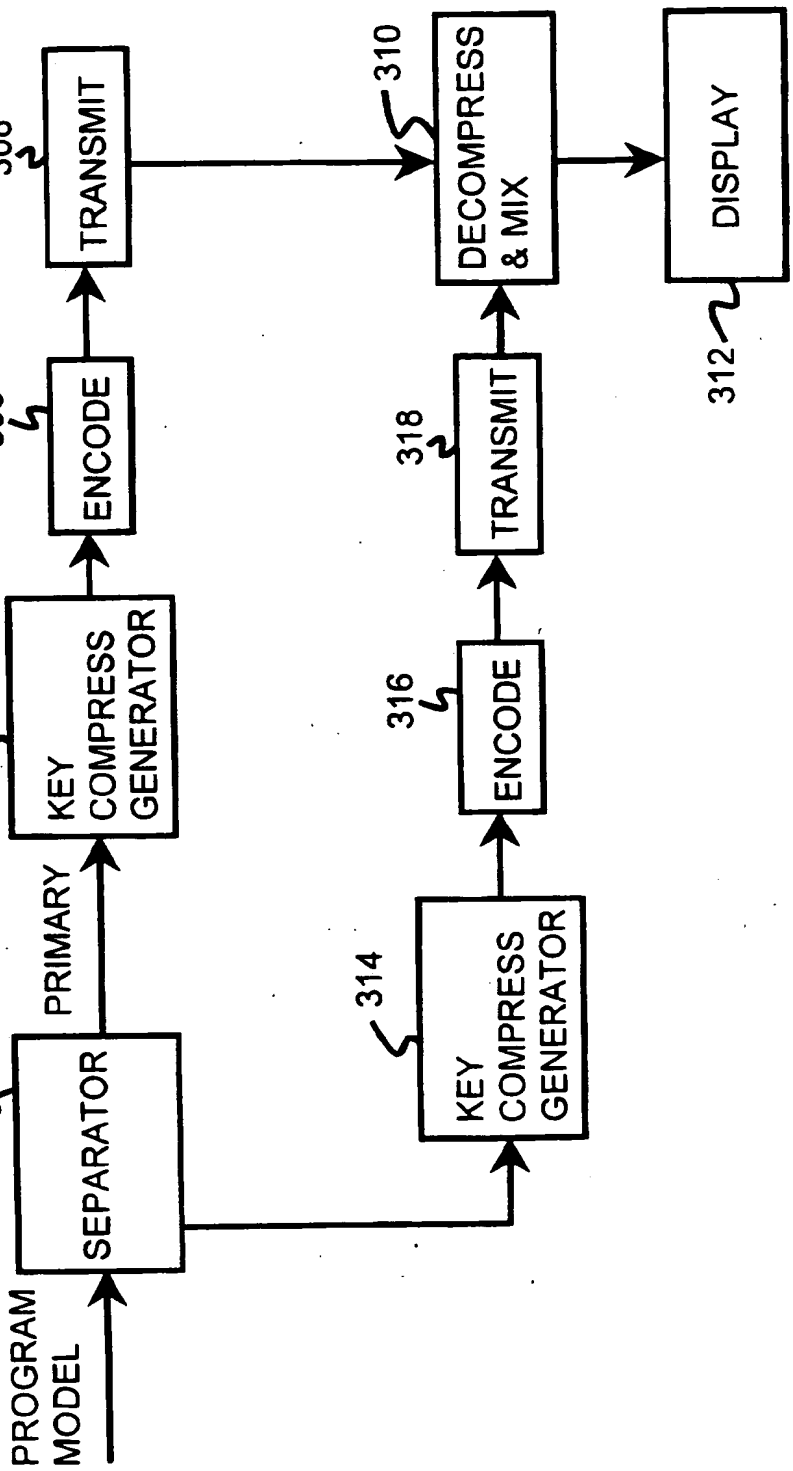

PROGRAM MODEL
302
SEPARATOR
PRIMARY
304
KEY COMPRESS GENERATOR
306
ENCODE
308
TRANSMIT
314
KEY COMPRESS GENERATOR
316
ENCODE
318
TRANSMIT
310
DECOMPRESS & MIX
312
DISPLAY

FIGURE 6

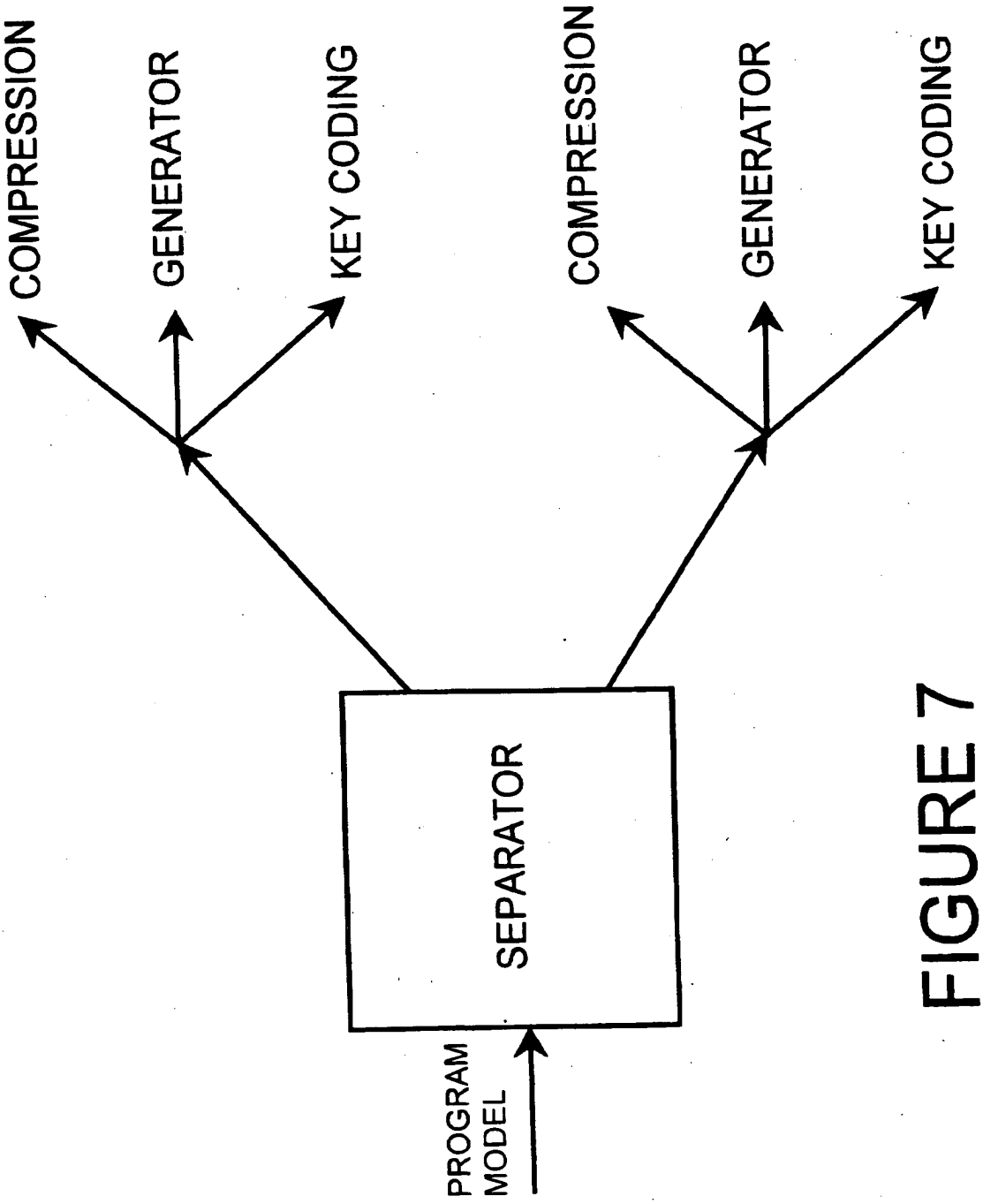

COMPRESSION
GENERATOR
KEY CODING
COMPRESSION
GENERATOR
KEY CODING
SEPARATOR
PROGRAM MODEL

FIGURE 7

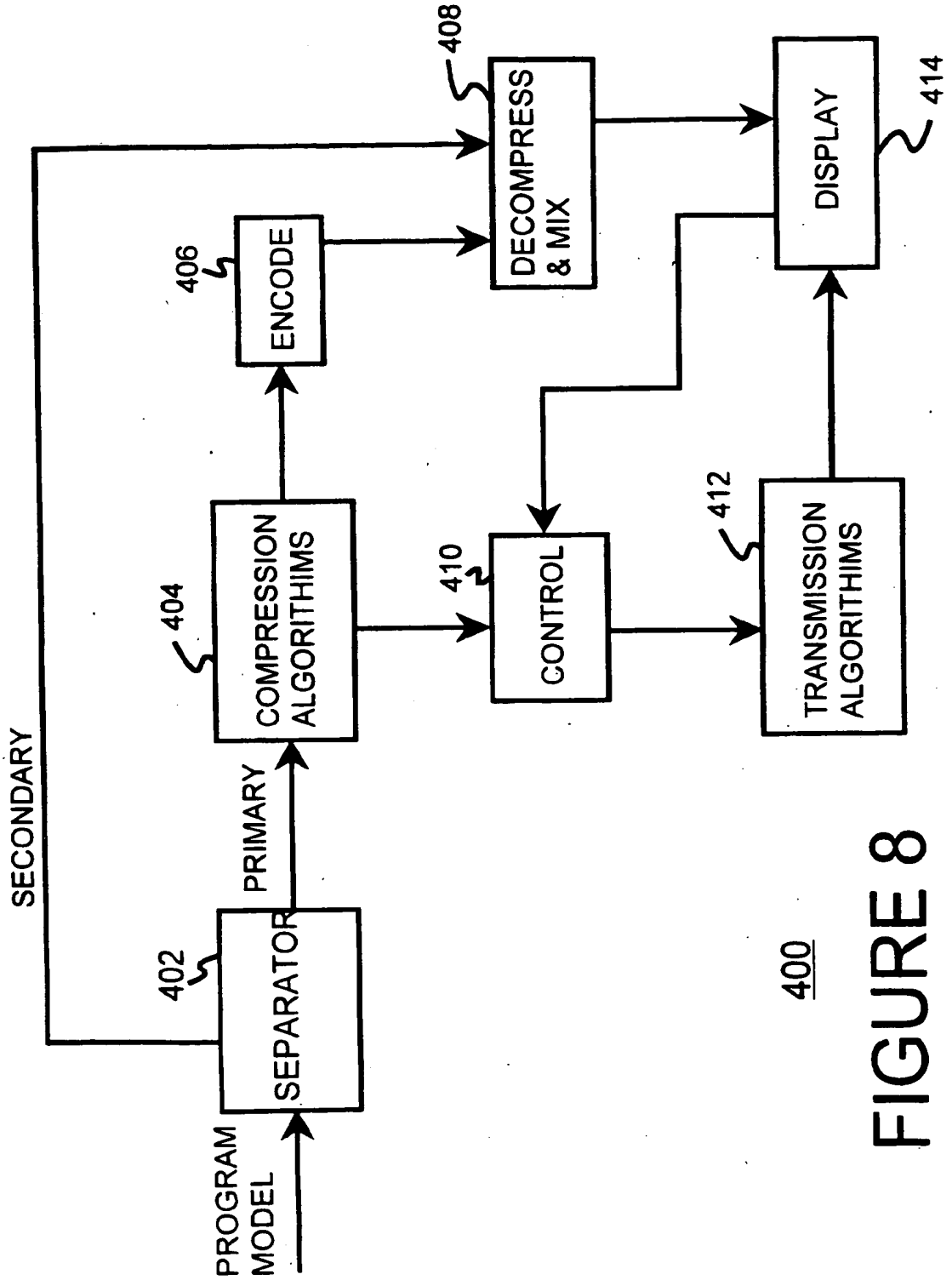

PROGRAM MODEL
SEPARATOR
402
PRIMARY
SECONDARY
COMPRESSION ALGORITHIMS
404
ENCODE
406
DECOMPRESS & MIX
408
CONTROL
410
TRANSMISSION ALGORITHIMS
412
DISPLAY
414
400

FIGURE 8

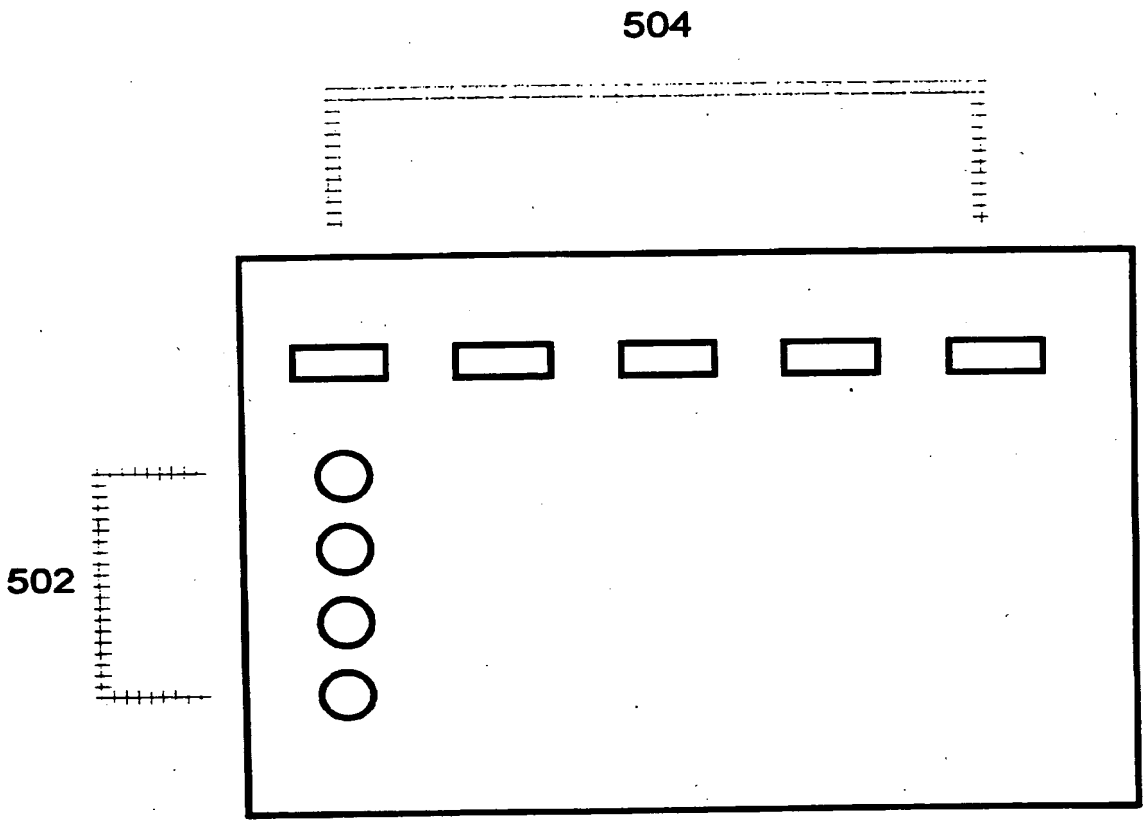


FIGURE 9

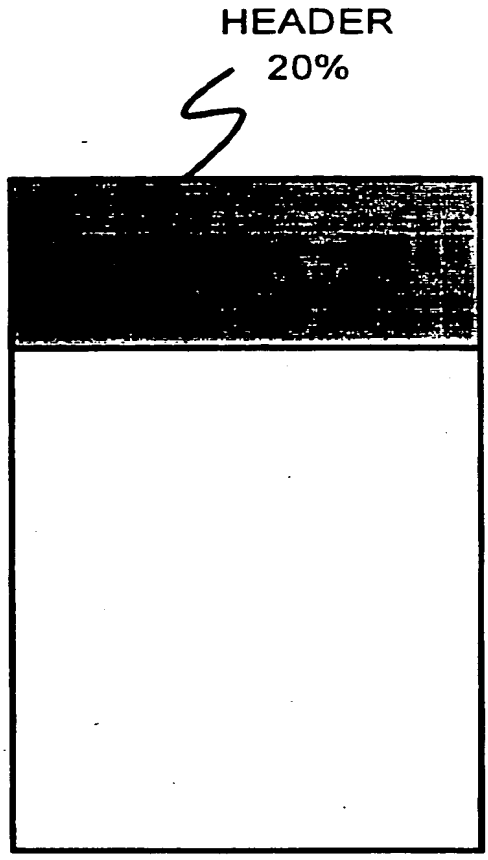
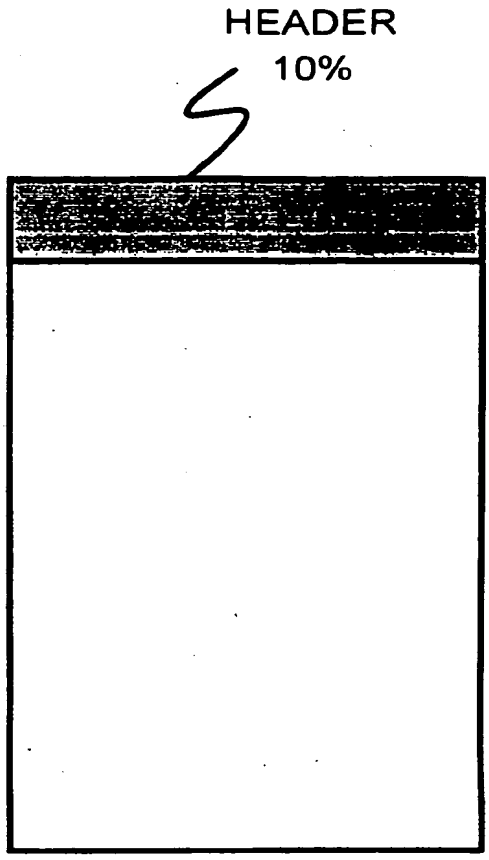


IMAGE FILE

FIGURE 10A



TEXT FILE

FIGURE 10B

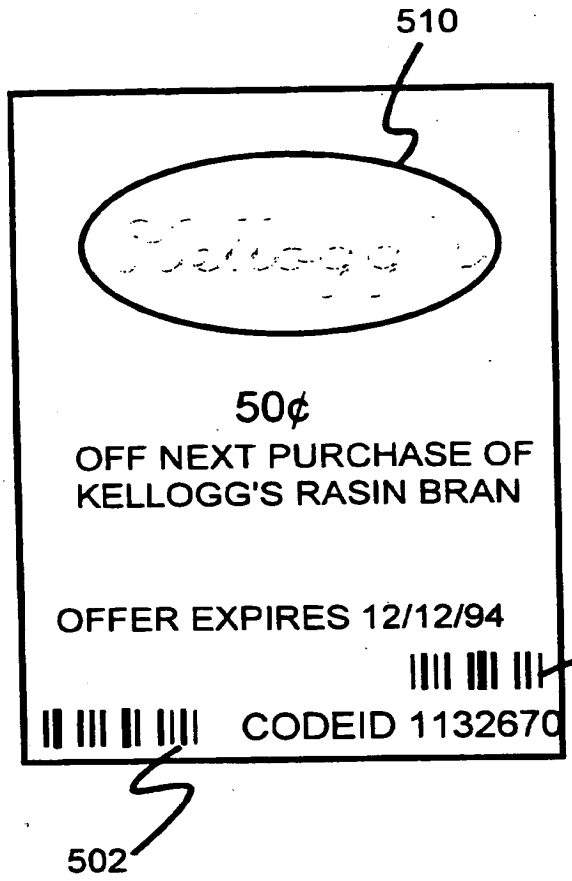


FIGURE 10C

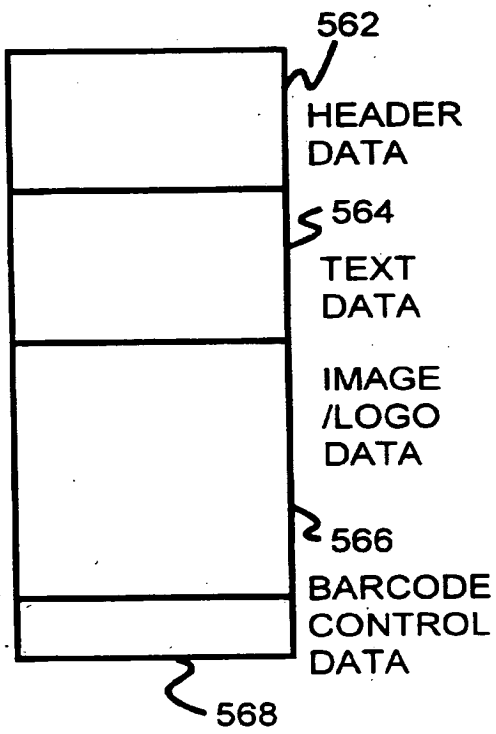


FIGURE 10D

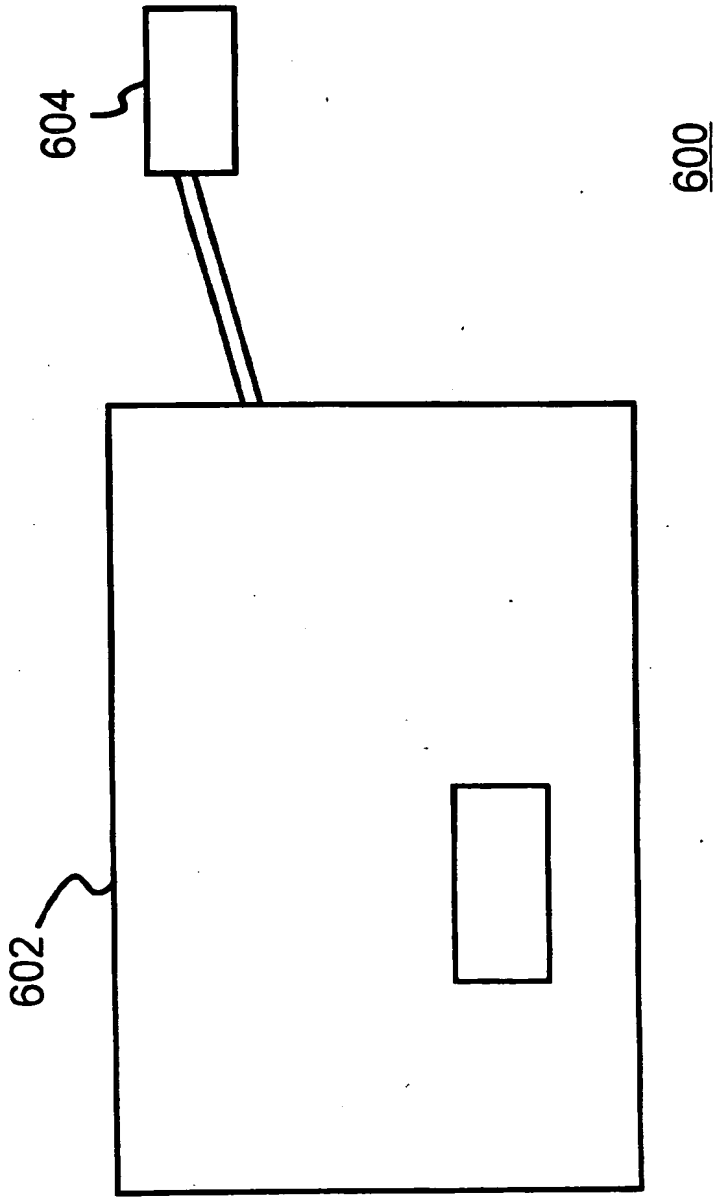


FIGURE 10E

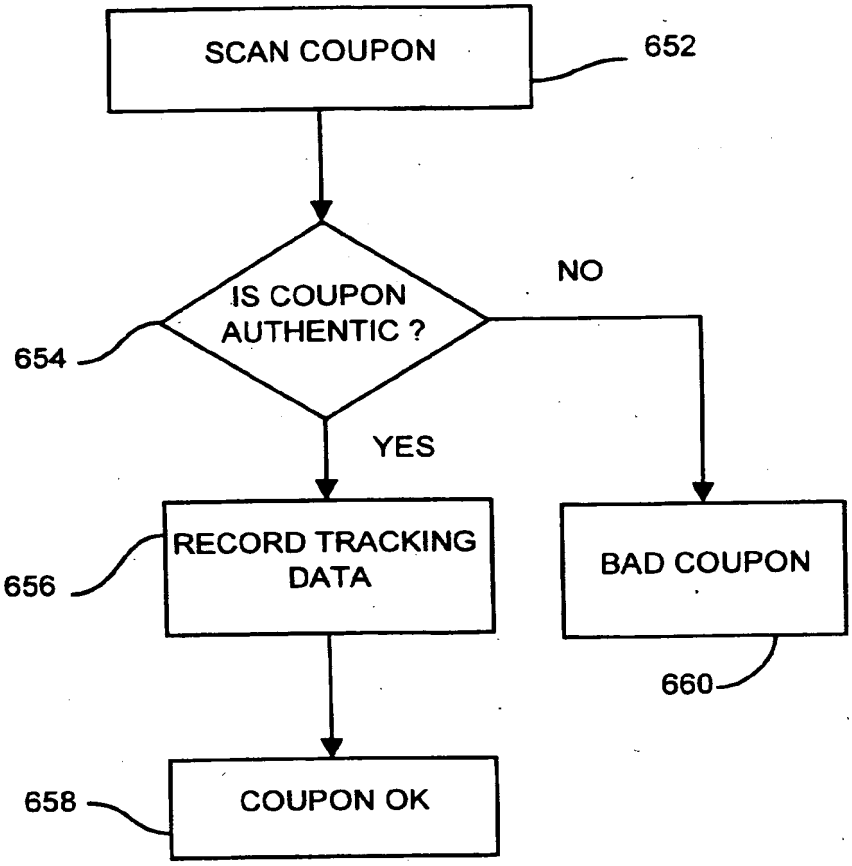

SCAN COUPON
652
IS COUPON AUTHENTIC ?
654
NO
YES
RECORD TRACKING DATA
656
BAD COUPON
660
COUPON OK
658

FIGURE 10F

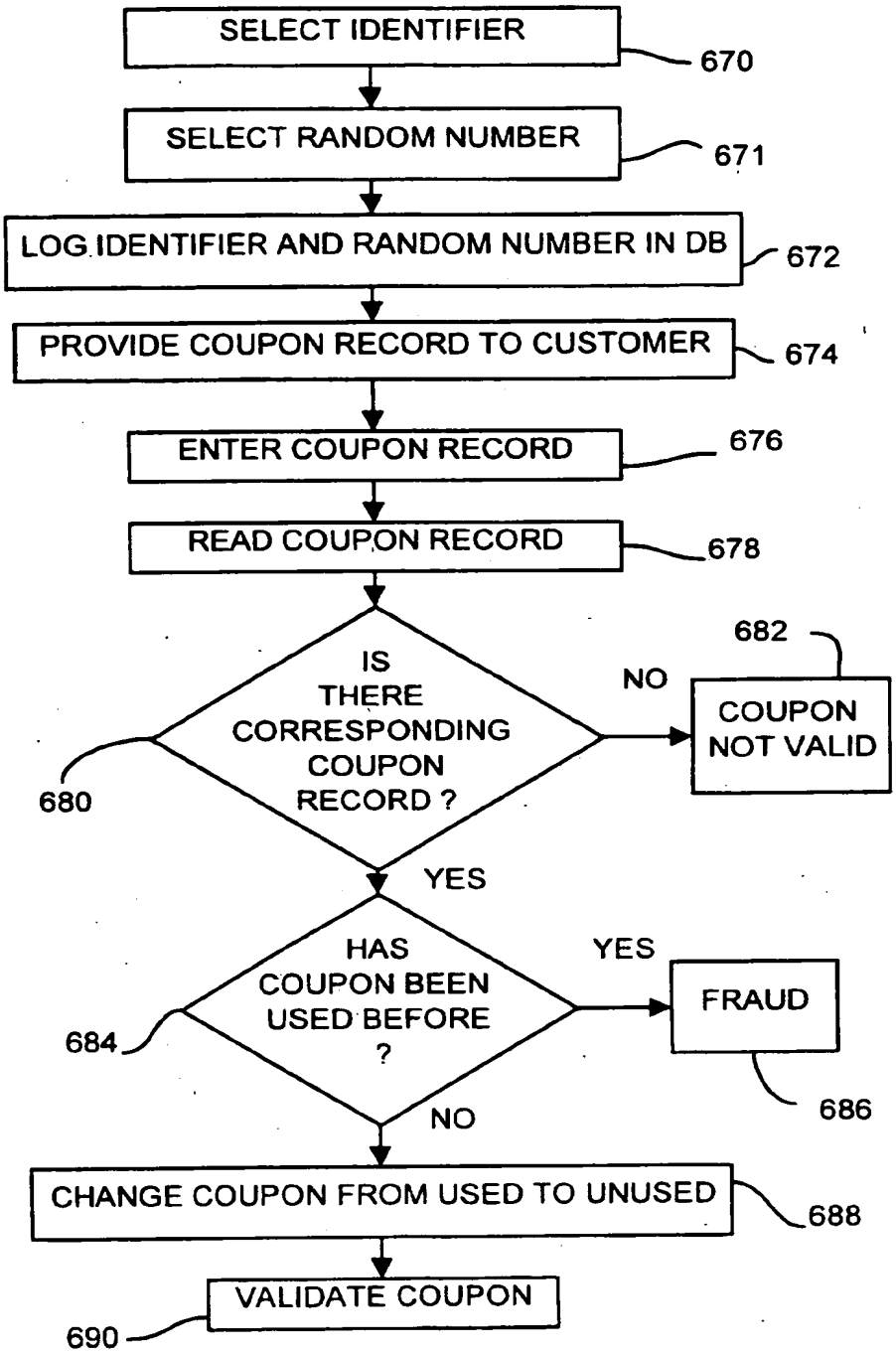
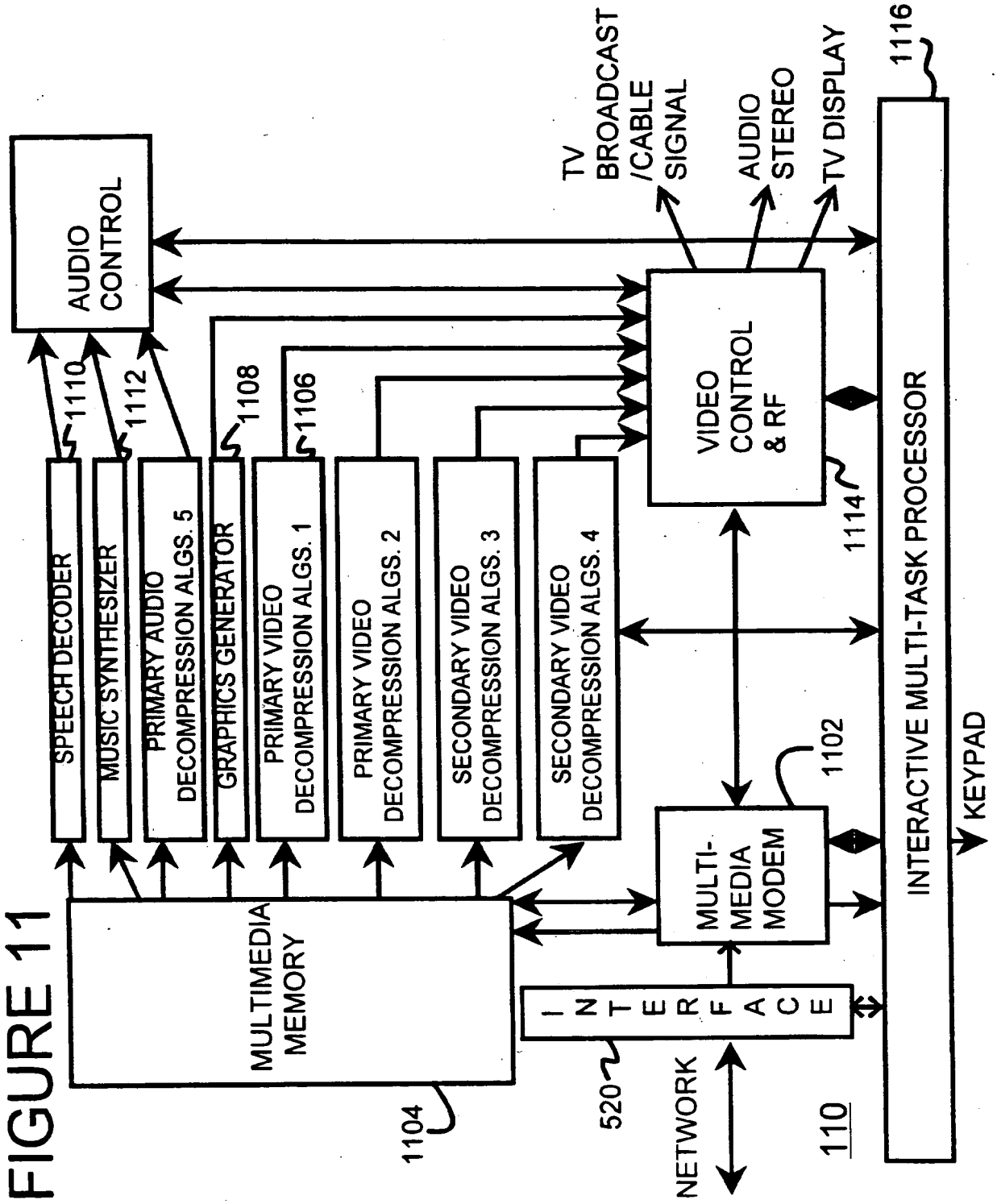

SELECT IDENTIFIER
670
SELECT RANDOM NUMBER
671
LOG IDENTIFIER AND RANDOM NUMBER IN DB
672
PROVIDE COUPON RECORD TO CUSTOMER
674
ENTER COUPON RECORD
676
READ COUPON RECORD
678
IS THERE CORRESPONDING COUPON RECORD ?
680
NO
682
COUPON NOT VALID
YES
HAS COUPON BEEN USED BEFORE ?
684
YES
FRAUD
686
NO
CHANGE COUPON FROM USED TO UNUSED
688
VALIDATE COUPON
690

FIGURE 10G

FIGURE 11


AUDIO CONTROL
SPEECH DECODER
MUSIC SYNTHESIZER
PRIMARY AUDIO DECOMPRESSION ALGS. 5
GRAPHICS GENERATOR
PRIMARY VIDEO DECOMPRESSION ALGS. 1
PRIMARY VIDEO DECOMPRESSION ALGS. 2
SECONDARY VIDEO DECOMPRESSION ALGS. 3
SECONDARY VIDEO DECOMPRESSION ALGS. 4
1110
1112
1108
1106
VIDEO CONTROL & RF
1114
TV BROADCAST /CABLE SIGNAL
AUDIO STEREO
TV DISPLAY
1116
MULTIMEDIA MEMORY
1104
MULTI-MEDIA MODEM
1102
INTERFACE
520
NETWORK
INTERACTIVE MULTI-TASK PROCESSOR
110
KEYPAD

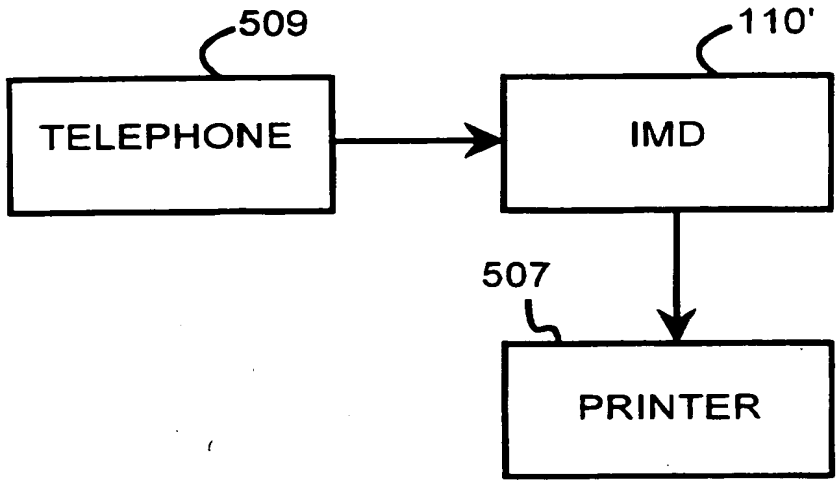


FIGURE 11A

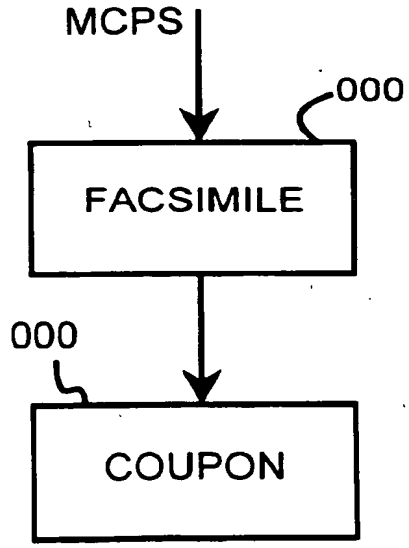
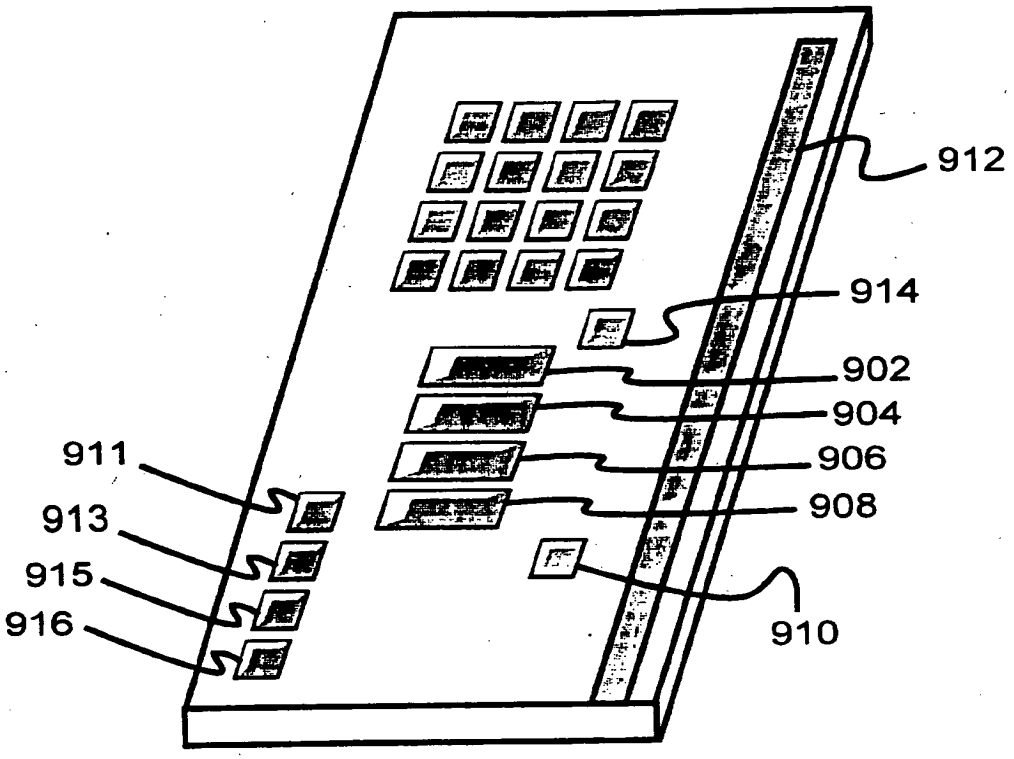


FIGURE 11B



900

FIGURE 12

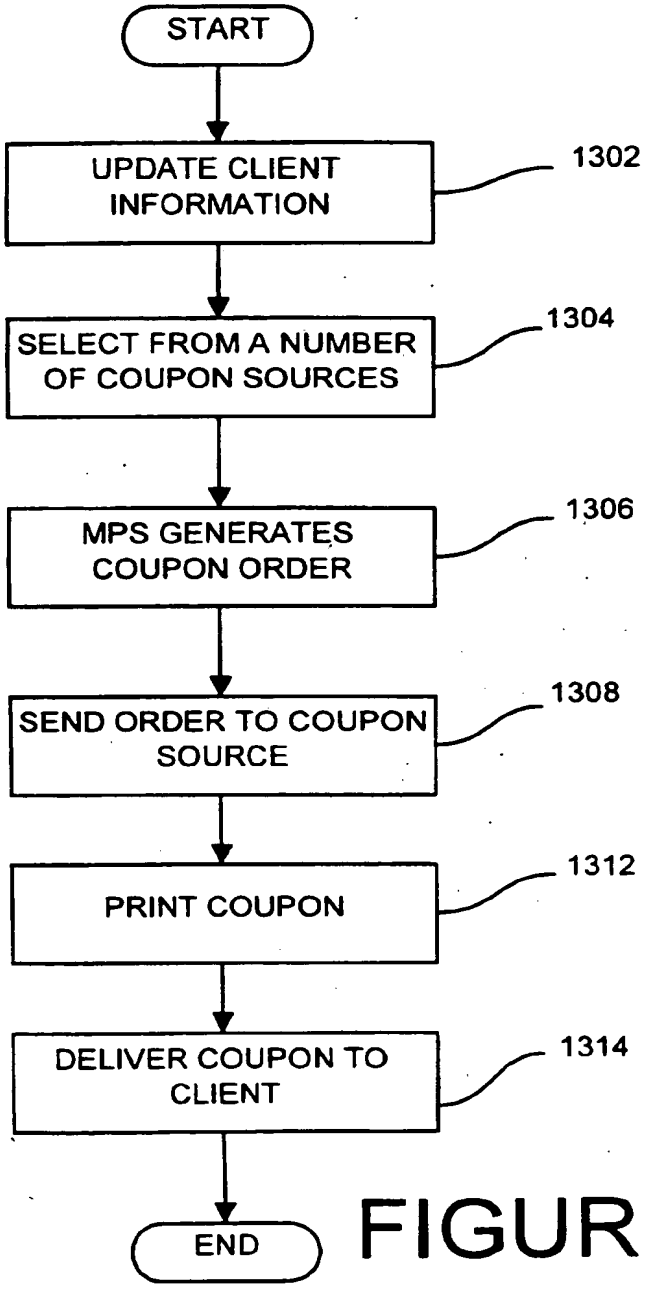

START
UPDATE CLIENT INFORMATION
1302
SELECT FROM A NUMBER OF COUPON SOURCES
1304
MPS GENERATES COUPON ORDER
1306
SEND ORDER TO COUPON SOURCE
1308
PRINT COUPON
1312
DELIVER COUPON TO CLIENT
1314
END

FIGURE 13A

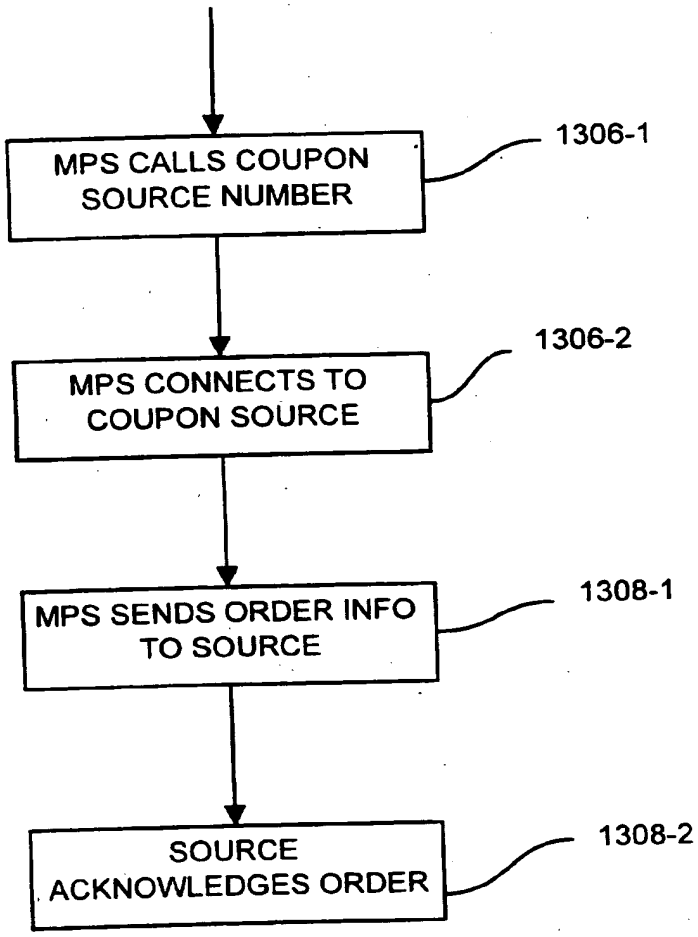

MPS CALLS COUPON SOURCE NUMBER
1306-1
MPS CONNECTS TO COUPON SOURCE
1306-2
MPS SENDS ORDER INFO TO SOURCE
1308-1
SOURCE ACKNOWLEDGES ORDER
1308-2

FIGURE 13B

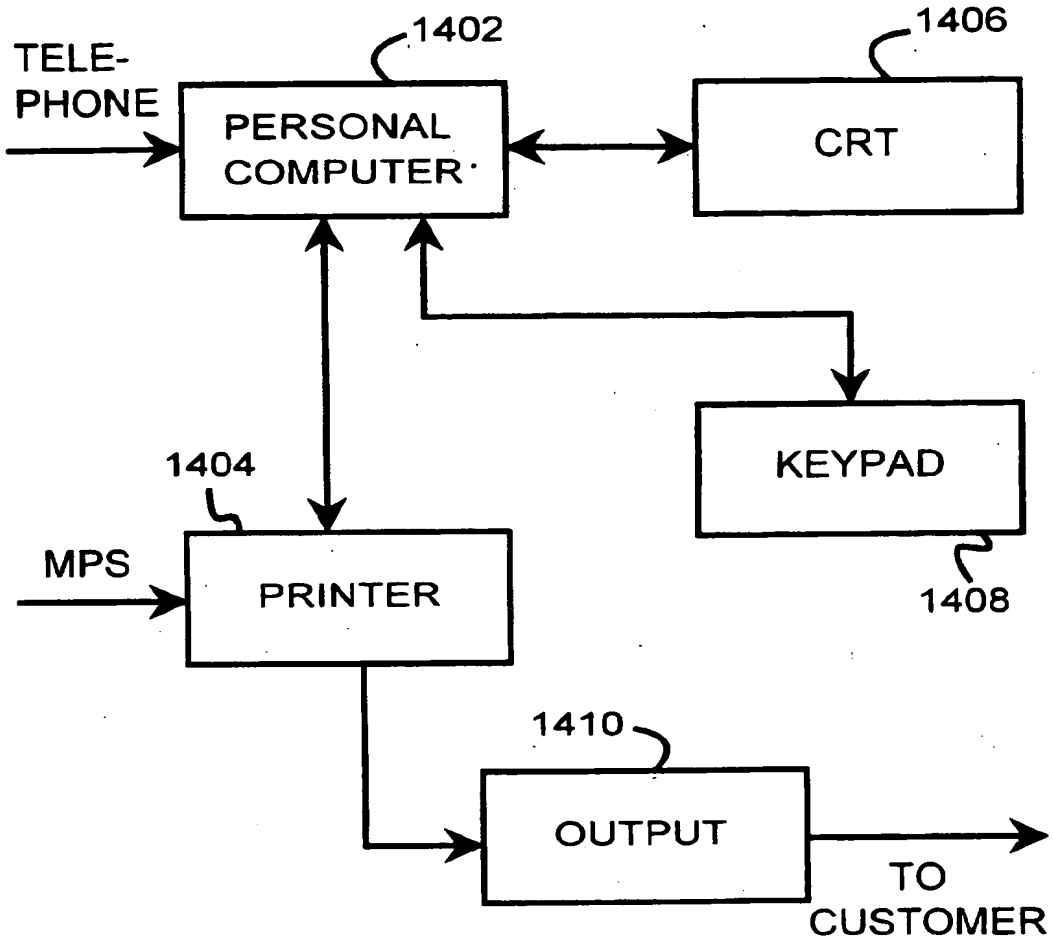

TELE-
PHONE
1402
PERSONAL
COMPUTER
1406
CRT
KEYPAD
1408
1404
MPS
PRINTER
1410
OUTPUT
TO
CUSTOMER
1400

FIGURE 14A

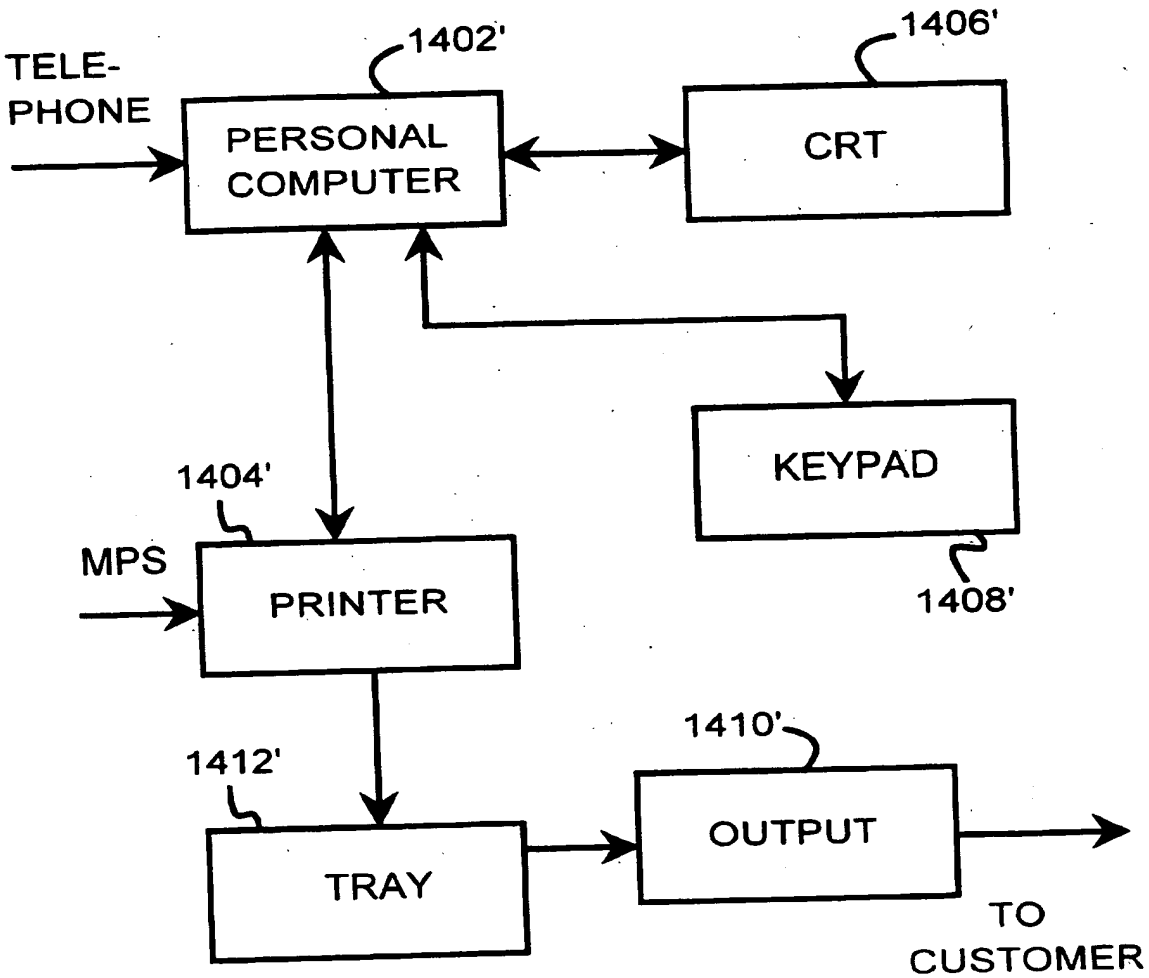
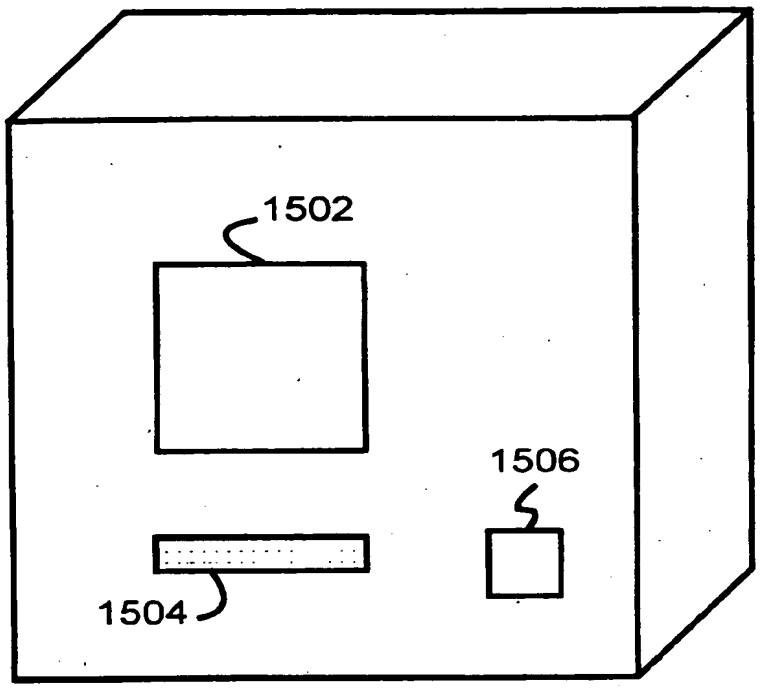

TELE-
PHONE
1402'
PERSONAL
COMPUTER
1406'
CRT
KEYPAD
1408'
1404'
MPS
PRINTER
1412'
TRAY
1410'
OUTPUT
TO
CUSTOMER
1400'

FIGURE 14B



1500

FIGURE 15

COUPONING ISSUANCE AND TRACKING SYSTEM FOR A COMMUNICATIONS NETWORK

FIELD OF THE INVENTION

The present invention relates to a communications network and more particularly the present invention relates to the interactive transfer of multimedia information for coupon issuance tracking within such a network.

BACKGROUND OF THE INVENTION

There are many types of communications networks. What is meant by communications networks in the context of this application are networks which allows for the transmission of information thereon. For example, a hotel or hospital would contain such networks. In such networks, there are a series of connections to each room or the like for presentation of various multimedia information. Oftentimes this information takes the form of video material that is provided to each of the customers or patients.

The characteristic of these types of networks is that there is a feedback path that provides the owner of the network with knowledge of the activities of the particular user on the network. Hence, in the case of a hotel system, if a person orders a service there is a way for the owner of the network to know that the service has been ordered by that particular person.

The major problem with existing communications networks are that they are not fully interactive. That is, there is no way to actively select multimedia information from outside of the network in real time. This has additional significance when attempting to produce coupons or other products to encourage a customer to buy a particular product or the like. In addition, these buying patterns of a particular consumer can not be adequately tracked within most communications networks. Finally, there is no way to determine any additional demographic information or other information from the user.

Accordingly, what is needed is a system for allowing a user of such a network to interactively access information outside of the network without requiring additional equipment within each user location. In addition, the system should be one that does not affect the normal operation of the existing communications system. The system should be one that can facilitate the tracking of information about the user. The present invention addresses such a need.

SUMMARY OF THE INVENTION

A couponing issuance and tracking system for use in an interactive multimedia transmission network is disclosed. The system comprising a multimedia call processing system responsive to program materials for providing multimedia information. The system further includes means interactively responsive to the multimedia call processing system for controlling the flow of multimedia information to the multimedia call processing system. The system also includes a plurality of interactive multimedia devices (IMDs) for receiving and transmitting multimedia information to and from the multimedia call processing system. Finally the system includes a printer which is responsive to multimedia information from at least one of the plurality of IMDs for generating coupons.

In another aspect, the coupon includes encoded information thereon. In yet another aspect, the encoded information is utilized for tracking demographic information. In yet another aspect, the encoded information is utilized for providing antifraud information.

The interactive devices are utilized to vastly increase the amount of information that can be processed to allow for a couponing system that includes tracking information.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a block diagram of a prior art communications network.

Figure 2 is a block diagram of a general embodiment of an interactive multimedia system for use in a communications network.

Figure 2A is a block diagram of an embodiment of an interactive multimedia system for use in a hotel network.

Figure 3 is a block representation of the multimedia call processing system (MCPS) in accordance with the present invention.

Figure 4 is a first specific embodiment of an interactive multimedia system for use in a communications network.

Figure 5 is a second specific embodiment of an interactive multimedia system for use in a communications network.

Figure 6 is a flow chart of a first embodiment of the optimization method which is utilized in the communications network in accordance with the present invention.

Figure 7 is a representation of the separation of primary and secondary multimedia information.

Figure 8 is a flow chart of a second embodiment of the optimization method showing the cooperation of a compression algorithm with a transmission algorithm in accordance with the present invention.

Figure 9 is a block that shows the cooperation of a compression algorithm with a transmission algorithm in accordance with the present invention.

Figures 10A and 10B are a block representations of information within a coupon in accordance with the present invention.

Figure 10C is a diagram of one embodiment of a coupon produced by the interactive system.

Figure 10D is a block representation of the information in the coupon of Figure 10D.

Figure 10E is a block representation of a coupon verifier in accordance with the present invention.

Figure 10F is a flow chart of the operation of the coupon verifier of Figure 10F.

Figure 10G is a flow chart of an antifraud detection scheme in accordance with the present invention.

Figure 11 is a block diagram of a general embodiment of an interactive multimedia device (IMD) in accordance with the present invention.

Figure 11A is a block diagram of an embodiment of an IMD in which the IMD is coupled to a printer in accordance with the present invention.

Figure 11B is a block diagram of an embodiment of an IMD in which the IMD is coupled to a fax in accordance with the present invention.

Figure 12 is a representation of a remote control utilized in conjunction with the system architecture of the present invention.

Figures 13A and 13B are flow charts of a couponing system that utilizes the interactive system in accordance with the present invention.

Figure 14A is a block diagram of an electronic inventory control system utilized in the interactive system in accordance with the present invention.

Figure 14B is a block diagram of a physical inventory control system utilized in the interactive system in accordance with the present invention.

Figure 15 is a block diagram of a store KIOSK system in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to an interactive system for a communications network. The following description is presented to enable one of ordinary skill in the art to make and use the invention and is provided in the context of a patent application and its requirements. Various modifications to the preferred embodiment will be readily apparent to those skilled in the art and the generic principles and features described herein may be applied to other embodiments. Thus the present invention is not intended to be limited to the

embodiment shown but is to be accorded the widest scope consistent with the principles and features described herein.

Referring now to Figure 1, what is shown in simple block diagram form is a prior art communications network. In the following discussion, the present invention will be discussed in the context of a hotel system. It should be understood however that there are other types of communications networks such as hospitals, educational institutions and many conventional head end networks or the like where the principles of the present invention would apply.

The system 10 includes a hotel PBX system 12 for receiving and transmitting telephone calls, property management system 14 and a video control system 16 which could be used to access the pay per view movies or the like. The video control system 16 includes an in-room remote link and is connected to the services operation platform 14. The property management system (PMS) 14 keeps track of the users that order the movies.

The system 10 as above described is not fully interactive. In this type of system there are a number of video units or VCRs located within the system and they are switched in when the appropriate customer or client wants to use the video unit. Hence, these video units cannot be individualized to a particular user because there are simply not enough units. For example, there may be a bank of 64 VCRs which would service a 500 room hotel. Each of the VCRs would have a separate movie. Accordingly, in this case there is a possibility that a particular movie would not be available. In addition, this type of arrangement severely limits the number of choices available.

Before the present invention is described in detail certain background information should be discussed to clarify the utility of the present invention in terms of existing communications networks. In a multimedia system, various sensory information is provided to a receiver. In the case of video information, this information takes the form of foreground and background images that display a particular scene. In the case of audio information, the foreground and

background signals are such that the foreground information is speech and the background information is music.

Typically, multimedia systems in whatever form provide this information over a single transmission line. In so doing, the amount and quality of the multimedia information is severely limited by the bandwidth of the transmission line.

The present invention first differentiates between important and less important multimedia information by separating the information into primary and secondary layers through the use of a program model to minimize the bandwidth limitations. In such a system each layer will have its own set of parameters that are important psychographically, however, the secondary layer will not vary as much as the primary layer.

What is meant by a program model refers to psychographic parameters within the multimedia system, that is parameters that relate to an individual's sensory perceptions when encountering multimedia information. These parameters comprise a set of unique and consistent elements for a particular class of multimedia information. In accordance with the present invention, its multimedia information is separated into different layers in accordance with the program model. Therefore, by way of example, in the instance of video images, the foreground and background information might be divided into different layers. Similarly, in the case of audio information, the news information, weather information, or the like may be one layer whereas the background music may be the other layer. In the case of coupons, the foreground may be text associated with coupon offer. The background may be a layer image or the like.

In the present invention, these layers will be divided into primary and secondary layers in accordance with the information's importance relative to the program model. The most important information is identified and enhanced to provide the best quality information to the receiver of the multimedia information.

In the preferred embodiment, the primary layers will be nhanced in such a way to provide a perceived improvement in quality of the multimedia information presented. In one embodiment the secondary layers are presented that may or may not be enhanced. Thereby the important information or the primary layers that are to be transmitted can be identified and selectively enhanced in accordance with the present invention.

In addition, the primary layers generally can be enhanced through critical psychographic parameters take the form of spatial, color, audio, and temporal variables that occur in the primary or secondary layers.

In a communications network it is important that the multimedia information that is produced, transmitted and received is enhanced in some manner. This is necessary to ensure that high fidelity, high quality information is presented to the viewer. Therefore, it will be possible to bring a superior product into the network. It is known, for example, it has been possible to provide video information over the telephone lines. However, it has been a problem sending high quality video information due to the bandwidth requirements that are needed to provide such high quality video information.

The present invention is directed towards a method and apparatus for providing a coupon issuance and tracking system. To more fully explain such a method and apparatus, refer now to Figures 2-5 which shows a block diagram of a general embodiment and block diagrams of specific embodiments of the overall system architecture for an enhanced interactive multimedia system for a communications network. The overall architecture would be connected to a telephone network or the like so as to readily access the transmission lines located therein.

Figure 2 is a block diagram of the overall system architecture 40 for an enhanced interactive multimedia system. The overall architecture 40 would be connected to a telephone network or the like so as to readily access the transmission lines located therein. Referring now to Figure 2, the system architecture 40 comprises an interactive multimedia mastering system (IMM) 42

which receives program source material. The IMM system provides information from the telephone network to a multimedia call processing system (MCPS) 44 and an auxiliary system 46. The multimedia call processing system 44 will provide and receive information from interactive multimedia devices (IMDs) 52. The MCPS 44 is also coupled to a printer 29 to provide the coupons. In this fashion, a system could be configured and no special equipment is required. All that is necessary is the telephone to select coupons. Thereafter, MCPS can create customized direct mail for the customer, which can include the unique coupons encoded with identifier information which has been selected by the customer utilizing the telephone. The structure of the IMDs 52 can take on many different forms dependent upon how much intelligence is located in an IMD 52 relative to the system architecture 40.

The system architecture 40 provides program material which will enhance the interactivity of information that is transmitted along the telephone network. Accordingly, what the system architecture 40 represents, in fact, is an additional network which would receive information from the program source which would also be part of the existing telephone system. The system architecture 40 will then be utilized to provide for enhanced multimedia information through psychographic manipulations or other enhancements to the systems to provide for a coupon which can be issued and tracked in a variety of ways. The system 40 as above-mentioned includes an IMM 42 that provides much of the optimization of the program source material for presentation to MCPS 44.

Referring now to Figure 2A, a general embodiment of an architecture 100 for a hotel is shown that includes a multimedia processing system (MPS) 102 which is coupled to receive information from and transmit information to a video control system 104, an account computer 106, a service operations platform SOP 107, and a telephony switching system 108. The MPS 100 is also coupled to an interactive multimedia decoder (IMD) 110, a CD/I device 112, a laser disk 117, video camera 121, compact disk (CD) player 125, personal computer (PC) 119, video camera recorder (VCR) 123, a printer 129 and other d vices 114. In this

system each of these devices can be utilized to provide updatabl multimedia information. For example, a compact disk player 125 can be utilized to jump to different places to provide multimedia information. It could be utilized in conjunction with an IMD to augment the fixed media with interactive material (updatable video source) material.

The cable feed line of the system 100 in turn is coupled to the video control system 104. The account computer 106 and the SOP 107 are also directly coupled to the telephone switching system 108 via line 120. The telephone switching system 108 is capable of sending and receiving outside calls. The video control system 104 is capable of sending and receiving a remote signal from a cable system, telecommunication system or the like.

Another portion of the invention is an interactive voice response system 111. This system includes a telephone 113 which connects to the telephony switching 108 via telephone links. The telephone 113 also could include a credit card slot. There is also included within the system 111, a remote control 900 which will be described in detail later and a television 115 which is coupled to the cable 116.

In this specific embodiment, the multimedia processing system (MPS) 102 receives program source material from the SOP 107 and from the control system 104. The MPS can also operate an interactive voice response program independently or integrated into other interactive multimedia programs.

The SOP 107 is utilized for receiving facsimile and voice messages. The SOP 107 can also be utilized in conjunction with pagers and the like to relay messages. By linking the account computer 106 to MPS 102 messages can be displayed on a monitor within the guest room. In addition, faxes can be displayed on the television and could be forwarded to other locations.

A master multimedia processing center (MPC) 109 is also coupled to the closed cable system 100 via connection to the MPS 102. The MPC 109 is coupled to a plurality of closed cable systems to provide enhanced interactivity thereto.

A critical portion of the system 100 is the telephone switching system 108

interface. Through the use of this architecture the switching system 108 can be controlled to provide the appropriate information to the user. Through the use of the interface devices (IMD 110, CD/I 112 and the other device 114) and the MPS 102, the switching system 108 can be controlled in such a manner that the user doesn't have to remember a telephone number to obtain the desired information. This control can be accomplished through either a digital link that is directly interfaced to the telephone switching system 108 or through an analog link where only a normal phone connection to the system. Through either of the systems an emulation of the customer actions would be undertaken.

In a typical example, a call is made by the user to order a coupon. The MPS 102 places call to the room through control of the system 108. The room telephone will ring and the MPS 102 will send a message to the switching system 108 that the customer would like to access a particular coupon to make reservations. All of these activities are done transparently to the user.

The MPS 102 will provide and receive information relating to the couplers from and to interface devices 110, 112, and 114. The interface devices 110, 112, and 114 are in the hotel facilities connected either to the hotel video cable system through use of the video/audio outputs or connected via digital links from interface devices 110, 112 and 114 in each guest's room.

Referring now to Figure 3 what is shown is the preferred embodiment of a MPS 102. The MPS 102 comprises a distributed computing architecture. The distributed computing architecture includes a master node 200 that has, in this case, three server nodes 204, 206, and 208 for the IMD, CD/I and the other devices respectively. The other devices that could be coupled to MPS 102 are,for example, but not limited to video games, a CD ROM device, a personal computer, or a specialty device such as a translator or gaming device such as a video slot machine or the like.

Each of the server nodes 204, 206 and 208 have client nodes 210, 212, 214, 216, and 218 connected to the respective interactive devices. Attached to each of the clients nodes 210, 212, 214,216, and 218 are ports 220. When connected

via th existing n tworks or the MPC 109 (Figure 2a) and th n on to connection to the interactive devices 110, 112, and 114 (Figure 2) which has its own processing storage and computing structure the entire network can be operated as a massive distributed computing environment. This system could be operated using a voice response system in the server or client modes for which ports 220 represent telephone ports connected to the communications network.

This environment shares all dimensions of computing, storage, transmission and peripheral resources (printing, product ordering, mailing functions, etc.). This type of computing architecture would include dynamic port allocation and would include incremental failure characteristics to allow for robustness of the MPS 102.

In addition through the use of this interactive system 100 of the present invention a multiplicity of different interactive devices can be utilized and no modification to the device need be made to allow for devices' use within the system. Accordingly the link between the MPS 102 and the interactive devices can be a serial link, a CD/I link, a cable link such as ethernet or telephone connection via a simple infrared relay control link.

In a first more specific embodiment shown in Figure 4, the multimedia processing system (MPS) 102 receives program source material from the services operation platform (SOP) 106' and from a pay video control system 104'. The control system 104' can begin coupon ordering.

The SOP 106' is utilized for receiving coupons. The SOP 106' can also be utilized in conjunction with pagers and the like to relay messages. By linking the SOP 106' to MPS 102 a coupon can be displayed on a monitor within the guest room or print a coupon at the printer 129.

The multimedia processing system 102 will provide and receive information relating to the coupons from to interactive devices 110' and 112'. The interactive devices 110' and 112' will be located in the hotel facilities connected either to the hotel video cable system through use of the video/audio outputs or connected via digital links from interactive devices 110' and 112' in each guest's room.

In a second more specific embodiment shown in Figure 5 the architecture is similar except that there is an IMD 110 in each guest room. The IMD 110 can also be used within an interactive voice response system 119 to provide a more complete interactive system. In this embodiment, the IMDs 110" can be utilized to provide the interactivity for each room. The structure of the IMDs 110" will be described in detail later in this specification.

The IMDs 110 can take on many different forms dependent upon how much intelligence is located in an IMD 110 relative to the system architecture 100. The system architecture 100 shown in different aspects in Figures 2-5 provides program material which will enhance the interactivity of information on the coupon that is transmitted along the video network. Accordingly, what the system architecture 100 represents, in fact, is an additional network which would receive information from the program source which would also be part of the existing closed cable system. The system architecture 100 will then be utilized to provide for enhanced multimedia information through psychographic manipulations or other enhancements to the coupons.

Within each of the IMDs 110 of the system 100 is an optimization technique for enhancing the quality of the multimedia information that is present. To more specifically describe this optimization technique, refer now to Figure 6 which is a block diagram of an optimization method in accordance with the present invention. This optimization technique has been described in detail in U.S. Patent Application Number 07/976,941, entitled, "Method for the Production and Transmission of Enhanced Multimedia Information", having a filing date of November 16, 1992, assigned to the assignee in the present invention, and that patent application is incorporated by reference in this application. The following paragraphs along with the accompanying figures will provide the details regarding the optimization method and how it will be used advantageously to provide an enhanced interactive multimedia system.

The purpose of the IMD 110 is to provide maximum interactivity while at the same time providing maximum retention of the program model of the coupon.

It is also important that there be minimum transit time for the interactivity while the information within the coupon has maximum replication. Therefore, it is very important that the program model psychographic parameters be well described. For example, the spatial, color, temporal, audio response, material concept, contention perception all should be very well described and defined in the program model of the coupon.

Referring again now to Figure 6 what is shown is a first embodiment of a flow chart for providing an enhanced interactive multimedia coupon that utilizes the principles of the present invention. The flow chart 300 comprises the steps of providing a program model of the coupon to a separator. The separator 302 will divide the information of the coupon into primary and secondary layers of interactive multimedia information. For example, the primary layer may be the text on the coupon. The secondary layer on the other hand may be the logo information on the coupon. The separation is automatic and can be accomplished in a variety of ways. For example, the layers can be separated by production sources. In another example, separation can be accomplished through key coding the layers. In yet a third example, the layers can be spatially separated or separated by the various colors. Finally, layers of information could be separated by a filtering process.

The primary layers are provided to the compression generation block 304. There are a variety of ways that the multimedia data can be changed or generated to use less bandwidth. For example, compression algorithms or their equivalents could be utilized to reduce the bandwidth used. In addition generators, such as in a tone generator system, could be utilized to reduce the bandwidth required. Finally, key coding systems could be utilized to reduce bandwidth use. Such systems will be discussed in more detail later in the specification.

In this embodiment, the primary layer of the coupon is provided to an encoder where the primary layer of the coupon is prepared for transmission via step 308. Thereafter the primary layer of the coupon is decompressed via step 110. The primary layer of the coupon is then decoded and mixed with the

secondary layer of the coupon via step 312 to provide an nhanc d interactive multimedia image of the coupon to the printer.

Similarly, the secondary layer of the coupon is compressed via step 314, encoded (via step 316) and then transmitted via step 318 and to decompress and mix, via step 310. The two signals (primary and secondary) are then sent to the printer via step 312.

In this embodiment, for example, for the optimization of a coupon, the primary layer can be the foreground image, the secondary layer can be a background image. Through the use of this type of optimization technique multimedia information can be enhanced while at the same time utilizing significantly less bandwidth.

To more fully understand this feature refer now to the following discussion. In a typical interactive multimedia system the information is all sent along one layer. The information that can then be transmitted is limited by the bandwidth of that layer.

In the prior art, the interactive multimedia information that could be transmitted along typical networks or transmission paths that are very limited because, for example, in the case of video images the bandwidth is not adequate to provide a high quality image to a printer.

Hence, in the present invention, by separating the multimedia information into primary and secondary layers and thereafter compressing the more important information utilizing well known compression algorithms, a system is described that can produce an enhanced coupon that easily be transmitted over existing networks.

To more fully describe the psychographic enhancement feature of the present invention refer now to Figure 7 which shown the various possibilities from a particular program model. The program model is provided to the separator 302 of the multimedia system.

Psychographic enhancements are critical to the improvement in interactive multimedia transmission and reception enhancements in the context of the

present application is information that is not transmitted but operates on, operates in conjunction with, or operates as a supplement to transmitted multimedia information. There are three separate categories that will be described that relate to psychographic enhancements.

The first category will be described as a cross correlation between the information that is being transmitted and being enhanced due to the presence of information that is not transmitted. Dithering of image is an example of this in that dithering masks artifacts of images that are present and that improves the image quality. This type of system does not remove the artifacts but actually just masks imperfections. A second example in the audio arena where secondary audio materials such as a sound of an ocean or the like which might mask problems in the audio quality of the primary sound (voice, music or the like).

The second category is where the signal is actually changed without the use of any control signal; for example, through interpolation or some other technique. The typical example of that is a graphic equalizer in which certain frequencies are enhanced depending on the range of the particular device. Another example of the second category is to frequency or amplitude compress a certain signal so as to further enhance the frequencies that are being transmitted. It is also known to use various filters to sharpen or provide certain information that will actually modify the signal without controlling it per se.

Finally, the third category is using the primary and secondary information to drive the other generators that might be present within the multimedia system. This can be utilized to either enhance the multimedia information or enhance the program model of the coupon.

As is seen in Figure 7, the primary multimedia information layer can be compressed to reduce the bandwidth utilizing well known algorithms. It is also seen that the signal can be replaced by a generator that is responsive to the primary/secondary layers signals. Finally, a key code could be used to cause information to be provided from a look-up table or the like.

Although all of the above methods provide advantages in accordance with the present invention, key coding has some additional non-obvious advantages when utilized in the optimization system of the present invention. In the following paragraphs the use of various key coding systems will be described generally along with their attendant advantages.

Typically, when looking at an interactive multimedia information signal there are several components of that information. The first component is the data or the multimedia information itself that is being conveyed. The second component is referred to as program model dynamics. That is the changes that occur in the interactive multimedia information due to for example, a fade that allows for a transition from one scene in the graphics or video image to another. Conversely, if you want to wipe away an image there is information associated with the multimedia data that would call out for that transition to change efficiently.

Finally, the third category of interactive multimedia information is what will be referred to in this specification which will allow a particular device or system to go from one category to another. In a typical interactive multimedia information system all this information is required to adequately transmit such information.

In its simplest form, a key has an identifiable code which dictates the commands on the other side of the device. The clearest example of such a keying system would be the very simple dual tone multi-frequency (DTMF) signal. This type of signal can be used in the telecommunications area to provide keying for low bandwidth protocol. These keys would then command a code table on the side of the network to provide certain information about the multimedia information to be displayed without requiring actual transmission of the multimedia information.

A more specific version of this type of key coding is what will be referred to in this specification as control information keying. What is meant by controlled information keying is where a key code is utilized to access particular

types of commands which can then be used to control other items on the other side of the network.

Such a table would then be utilized to access a certain set of multimedia information in the network. A final version of key coding will be called program branching keying is described by each of the keys representing a certain branch identification. Thus in this type of key coding the key is cross referenced to a particular branch of the interactive multimedia program where each of the branches allows plurality of functions or commands to be accessed in order to replicate the program model of the coupon.

The important feature that is provided by all of these types of keying coding arrangements is that information already present on the network can be utilized. Therefore, the processing power inherent in the network or the system being accessed can be utilized rather than having to have to provide that processing power within the optimization system itself.

It is also important to develop means to improve the transmission quality of the multimedia information, for example, the information may be transmitted utilizing a typical transmission algorithm with standard communication file data transfer protocols. The interactive multimedia information could also utilize specialized protocols that are optimized for the particular interactive multimedia information that is to be transmitted. In so doing the algorithm for the compression algorithm can be interactively matrixed with the transmission algorithm to provide the highest quality information with the maximum interactivity with the minimum transmission line.

Referring now to Figure 8, what is shown is a flow chart that shows the cooperation of the transmission algorithm with the compression algorithm to produce a high quality multimedia image for a coupon. The flow chart comprises providing a program model in which the primary and secondary layers are separated via step 402. The primary layer is compressed and encoded via steps 404 and 406.

A control element via step 410 is utiliz d to control a compression matrix and a transmission matrix. These two matrices comprise a plurality of compression algorithm and transmission algorithm respectively that are interactively controlled such that as the various algorithms are detected the quality of the multimedia information and the speed of the transmission are interactively determined.

The quality of the information could be determined manually or through the use of some control circuitry. It should be understood that these same matrices could also be used on the secondary layer. It was not shown or described for purposes of clarity and simplicity.

Referring now to Figure 9 what is shown is a block representation of a matrix of compression algorithm with transmission algorithm that could be utilized in accordance with the present invention. The circles 502 aligned in the vertical direction are the compression algorithms. The rectangles 504 aligned in the horizontal direction are the transmission algorithms.

For example the compression algorithms could be JPEG, a generator with MIDI, and a key for a weather map background. Similarly, the transmission algorithms could be optimized for JPEG, data compression for MIDI, or DTMF for key transmission type algorithms. To provide the highest quality multimedia information while at the same time utilizing minimum bandwidth the different algorithms can be selected in an interactive manner.

Hence, a first compression algorithm could be selected along with the first transmission algorithm. The multimedia information is reviewed either for image or audio quality than a second compression algorithm is selected. The multimedia information is reviewed and if the quality is not acceptable then a second transmission algorithm is selected. The quality of the information is reviewed. This process is repeated until the highest or desired quality multimedia information and interactivity speed are provided.

The multimedia information derived from the compression/transmission algorithms can be analog or digital in nature. However, in a digital signal there

are certain other features that can be taken to advantage that can be utilized in accordance with the present invention.

It is known that digital data information is typically sent in a file which specifies certain parameters of that data and the data information itself and within the data information itself is information which may not change for a certain set of files. In the case of an image file, the header information may specify the dimensions, pixel depth, and certain other features of the particular image. This file may take up a much as twenty percent of the data file.

Conversely, in a file such as text file which comprise a plurality of text information, the header may include discount information, related information and characteristics of that particular file. In both of the above mentioned examples, the header information may not change, through the use of the optimization method the amount of information may be significantly reduced over time.

Hence, in the case of the image file, the header could be sent first with no compression or with lossless data compression as the secondary file because it will always remain the same. The data file itself can then be compressed down to its smaller size.

Another method for enhancing the psychographic parameters is to provide some form of error detection and adjustment. As has been mentioned before the detection and adjustment can be accomplished via interpolation of the error. An alternative method of error corrector is through an error correction/transmission algorithm. What is meant by this, is relating the transmission to the compression to enhance interactivity.

In this type of system before the file is sent the base file is compressed and then decompressed. This decompressed file is called an expanded compressed base file. The expanded compressed base file is then compared to the original base file and an error file is then developed (the error file being the difference between the base file and the expanded compressed base file). The error file is compressed and sent along with the compressed version of the base file down the

line. These files are then combined and decompressed to provide an enhanced image.

Referring now to Figures 10A and 10B, it is seen that a data file utilizing this technique could initially be separated into primary and secondary layers. The primary layer of the coupon could be compressed using a first compression algorithm, the header information of the coupon could be sent first along a first transmission path and the compression signal could be sent along a second transmission path.

Therefore, the amount of storage necessary for the file is significantly reduced through secondary compression techniques. This information can then be transmitted or stored across the network rather than having to have all the information stored within a particular device within the optimization system.

In the case of the coupon 500, referring now to Figure 10C, the coupon 500 includes a logo 510, test information 512, bar code information 502 and 504. In a preferred embodiment, the coupon 500 would have encoded therewithin tracking information in this embodiment, bar code 502. This encoding allows demographic information to be provided back to the system when the coupon is utilized. In this way, additional products can be coordinated with the coupon purchases.

In addition, there is an antifraud code 506 placed on the coupon to ensure that these coupons are not counterfeit. In this embodiment, the antifraud code 506 is a bar code. However, one of ordinary skill in the art will readily recognize that either the tracking information code 502 or the antifraud code 506 could be a wide variety of types and their use would be within the spirit and scope of the present invention.

As is seen in Figure 10D, the header information 562, text date 564, logo data 566 and bar code control data 568 is allocated to certain portions of the memory. This information can be compressed in the appropriate manner to provide the enhanced multimedia information.

Accordingly, this system can b utilized effectively in a voice response system. Through the present invention a voice response can activate or operate in conjunction with a multimedia program to provide a fully interactive communication system.

An important feature of the couponing system is verifying the authenticity of the coupon. Figure 10E is a diagram of coupon verifier 600 in accordance with the present invention. The verifier comprises, a scanner 602 for scanning the bar code and the like and a detector 604 for detecting the information.

Referring now to Figure 10F is a flow chart of the operation of the verifier 600. As has been above mentioned, the coupon is scanned, via step 652. The detector then determines if the coupon is authentic, via step 654. If the coupon is authentic, then the tracking data is recorded, via step 656. The coupon is then determined to be authentic, via step 658, preferably by a green light on the detector. If, on the hand, the coupon is not authentic, via step 654, a bad coupon indicator is provided, via step 660, preferably by a red light on the detector 602.

ANTIFRAUD DETECTION

Antifraud detection can be performed in a variety of ways. One example is shown by the flow chart in Figure 10G. First, a coupon identifier is specified by the system via step 670 and a random number of predetermined digits is selected by the system via step 671. Thereafter, the random number is logged in a database within the MCPS along with the corresponding coupon identifier and other information to create a coupon record, via step 672. Next, elements of the coupon record are either generated and embedded in the coupon or given to the customer via audio, graphics or by some similar method via step 674. The minimum information provided is the code (i.e. the random number or the ID, dependent upon the user). The above steps describe the initialization for the antifraud detection system.

Next data embedded within the coupon or given to the customer is entered into the verification system, i.e. MPS, KIOSK or otherwise via step 676. The coupon is then read by the bar code reader, entered on a keypad, or by a voice

response system via step 678. The relevant elements of coupon records are ready for verification. Next, the coupon is cross referenced in the coupon data base for corresponding coupon record via step 680. If there is no record then it is not a valid coupon via step 682. If there is a record, then it must be determined if the coupon has been used before via step 684. If it has been used, then fraud is detected and appropriate action is taken via step 686. If the coupon has not been used then the system changes coupon from unused to used via step 688. Then information for validating coupon is sent via step 690.

One of ordinary skill in the art will recognize that the coupon, coupon verifier and the antifraud detection system are not limited to those shown in the figures. In addition it should be recognized that the selection of the coupon information could be changed and that would be within the spirit and scope of the present invention.

The present invention has been discussed in terms of compressing the primary layer or layer and by compressing and transmitting that primary layer in a particular way the interactivity of the system is enhanced. It should be understood that it may be equally important to enhance secondary layers to produce the same effect.

Therefore, it may be important to enhance the secondary layer, it may be important to enhance the primary layer or it may be important to enhance both. Therefore, the present invention through the use of compression and transmission algorithms and through the psychographic enhancement of the program model can enhance interactivity of a multimedia system.

It should also be understood that the function of the compression and transmission algorithms can also be done through other means; for example, a signal generator could be used to provide the same information. That is, a signal generator responsive to a particular layer or layer of information could be utilized to provide that information or some level of information that is representative of that layer. For example, a tone generator responsive to a signal from the

secondary layer to provide the tone that would be representative of that secondary layer.

Conversely, some type of graphics generator could be utilized to respond to that same type of signal to provide a certain type of graphic image or logo of the coupon. Finally, it should also be understood that the psychographic parameters can be adjusted by human operator or in the alternative can be adjusted or modified by an automatic means.

As has been before mentioned, it also is very important in this system architecture to have an interactive multimedia device 110 which will allow for the receipt of high quality multimedia information for the coupon from the system architecture. The IMDs 110 can be either located in the facility in the basement or are utilized with each of the television monitors within the hotel or hospital room to provide enhanced audio, video and graphic information within the communications network.

Figure 11 is a preferred embodiment of an interactive multimedia decoder (IMD) 110. The IMD 110 comprises several components. The cable or telephone line is coupled to a multimedia modem 1102. The multimedia modem 1102 is coupled to a multimedia memory 1104 which can be an expandable dynamic random access memory (DRAM) 1104. The multimedia modem chip 1102 provides data to a multimedia decompressor device 1106. The multimedia memory 1104 provides data to graphics/character generator 1108, speech generator 1110 and music synthesizer 1112.

In addition, the output of the generators 1108, 1110, and 1112 are provided to a video control chip 1114. Video control chip 1114 provides signals to a standard television display and receives signals from a standard television source. The multimedia modem 1102, the multimedia memory 1104, the multimedia decompressor 1106, the multimedia digital/audio control 1108, the video control chip 1114 and music synthesizer 1112 are all ultimately controlled by an interactive control interface 1116 which manages the operation of all of the above elements. The video control chip 1114 is coupled to a standard telephone

keypad input or for a television remote-type device or a special IMD remote can be utilized in a variety of ways which will be discussed in detail hereinafter.

Personalized and Demographic information can be stored on the IMD 110, the MCPS, or the MPS including age, sex of the user alone with technical information (IMD serial no, generators available). Therefore, upon connecting to the MPS 102, the IMD 110, or PMS can both forward this stored information either at the beginning of the session or anytime afterwards. This information can then be updated through the MPS 102 or directly at the IMD 110 through selection using the keypad or remote or by receiving the data from the MPS 102.

Accordingly this information provides the basis for highly accurate market research and commercial monitoring. Through the IMDs and MCPS real time information can be provided to the supplier of the information. This information can also be utilized to provide interactive advertising based on the choice of the advertiser as well as the demographics of the viewer. The type of information that could be useful for example would be the logging of each key stroke made on a remote control thereby monitoring the "browsing" or viewing habits of the customer in response to either interactive material supplied by the IMD or synchronized material from the cable head-end 122.

The function of each of the different components in a preferred embodiment is described in a summary fashion below.

Multimedia Modem 1102

A. Responsible for all communications between cable or phone line, optional serial port, interface to multimedia memory, multimedia decode, audio control, and processor control modules.

B. Supports standards protocol for half-duplex, full duplex, and half-duplex high speed operation.

C. On-chip encode/decode capability, D/A, A/D for voice, facsimile, and data functions.

D. Dual tone multi-frequency (DTMF) detect and generation.

E. Auto-detect voice/facsimile/data switch for transparent mode transition.

F. Incorporates controller unit with binary file transfer, facsimile, data, and voice modes, and optional proprietary multimedia processor control optimized protocol firmware.

G. Firmware allows IMD to use multimedia modem to perform call processing function including telephone call dialing and connection, unattended receipt of data and fax among other functions.

H. Include ability to decode data from video cable signal including VBI encoded data or data encoded in the video signal itself outside the VBI.

Multimedia Memory 1104

A. Nominal DRAM or VRAM for image mixing/processing, and auxiliary multimedia data store.

B. Nominal ROM for resident IMD control program.

C. Optional co-resident DRAM for multimedia data store and program/data store.

D. Optional non-volatile storage (extendible).

E. Memory control unit for VRAM/ROM/DRAM and non-volatile storage.

Multimedia Decode 1106

A. Responsible for real-time decompression of images transferred to or stored in the IMD 110.

B. On chip inverse discrete cosine transform processor. C. Reverse quantizer decoder/tables.

D. Built-in zoom, pan, chroma key, mix from compressed data incorporates interfaces to video data bus, multimedia memory, multimedia modem, video control, and microprocessor control sections.

Video Control 1114

A. Responsible for all IMD 110 video mixing, enhancements, and display functions.

B. Pixel processor for mix, zoom, pan, chroma key, transform on pixel data, transitions.

C. Graphics processor for figures (e.g., rectangles with color fill) generation, sprites, text with foreign characters, and scrolling.

D. Digital to analog conversion, analog to NTSC, NTSC video plus stereo audio to RF.

Graphics/Character, Speech Generator, Music Synthesizer 1108, 1110, and 1112

A. Responsible for enhancing received analog/digital audio, music synthesis generation, and overall analog mixing and audio effects.

B. Incorporates decoding burden.

C. Sampled instrument synthesis from compressed MIDI input.

D. Built-in micro-controller for multi-task generation.

E. Dual analog source mix, digital audio and synthesizer mix, analog audio control (volume, bass, treble, balance) for output to analog left/right audio.

Interactive Multi-Task Processor 1116

A. Responsible for multi-task execution of resident and downloaded IMD code for operation in conjunction or independently of the MCPS.

B. Master/slave microcontroller architecture for multi-task control of communications, multimedia memory, multimedia decode, digital video control, digital audio/synthesis, and interface management.

In a preferred embodiment, the IMD 110 will be utilized with a printer to transmit and receive multimedia information. Therefore through the use of the IMDs in the system a fully interactive system for providing coupons is provided.

Figure 11A shows an IMD 110' which has an output to a printer 507 and a telephone handset 509. The printer 507 then is utilized to print coupons responsive to the telephone handset.

Figure 11B shows a facsimile 700 which could be coupled to print the coupon. The facsimile 700 may in some instances be the preferred method for receiving coupons for business.

Another critical feature of the IMD 110 is to have a remote control that will work in conjunction with the television or other display to provide enhanced multimedia information. To more fully explain this feature refer now to Figure

12. The remote control 900 looks much like a telephone keypad. It has the numerals (0-9) and symbols (*-#) that are part of an ordinary telephone keypad. It includes an enter key 902 that is typically utilized to change information or change channels in the case of a television set. The control 900 would also include a volume key 904 and a channel or memory select key 906, a connect key 908, a telephone call key 909 and a multimedia toggle button 910. The telephone call key 909 is utilized to place a call to a designated telephone number or to a number associated with the multimedia information being viewed. The remote control 900 also includes a keys 911, 913, 915 that will control the fast forward, reverse, and slow motion of a video device. A special key 914 is provided to provide a coupon at a printer or the like.

The remote control 900 could also include a credit card slot 912. This credit card slot 912 would be utilized by the viewer to allow for the issuance of the coupon directly while viewing the television screen. The credit card slot 912 could also be utilized as an indicator that a certain room is being occupied by a particular person. This indication would preclude the need for a separate inputting of the relevant user information for billing information. Finally, the control 900 includes special effect keys 916, for example, for allowing for the browsing of a multimedia directory while simultaneously displaying a picture in the picture of the current broadcast TV channel. The remote control 900 can operate in an emulated keystroke mode in which pressing one key may be utilized to emulate a combination of keystrokes. In addition a call button may be provided which would allow for sending valid numbers to another location. The remote control 900 also has the capability of emulating other remote controls. For example, through the MPS different types of signals can be mapped with the remote control. The MPS provides the translation of the signals of a CD/I device for example.

The remote control 900 could utilize a radio frequency signal or audio signal to interact with the receiver and/or IMD 110 for the control of the IMD 110, control the selection of multimedia information, and for the control of other

devices. It is also known that a more conventional remote control could be utilized such as one that controls a VCR or a television and its use would be within the spirit and scope of the present invention. The remote control 900 also includes a positioning function. Accordingly, a motion detector or the like can be utilized within the remote to allow for pointing the remote at the television monitor to transmit certain information.

Another feature of the above-identified system architecture is that the program information can be linked to the network to provide for enhanced interactivity and program quality. For example, the program source can follow or be synchronized with the cable or broadcast feed to provide for enhanced distribution of program information. One specific example of this to take a new program, like CNN broadcasting, which consists of several short news items. For each news there could be stored large archives or program material related to a particular story. Hence, through multimedia interaction with for, example, the remote control 900 the stored program material can be accessed. This would allow the user to review the material in whatever detail was desired.

Another example, is in an advertising feed if a particular item was advertised, there would be the ability to refer to more detailed information about the product.

Yet another example of such a system is to have one service linked to another. An advertisement could be linked to a means for ordering the particular product being advertised including the placement of a phone call by the IMDs to the desired telephone number. In so doing, the linked system allows for additional services to be accessed.

The important requirements for this linked feature is that there is a knowledge of the contents of the system program requirements and there is a knowledge of where the user is in the program. For example, an IMD could be used for channel program identification in which the telephone call is linked to a particular channel that has been selected. Another example is link demographics for targeted interactive advertising.

Hence, in an advertisement for a diaper, for example, there would be the facility to access advertisements for related items such as baby powder, baby oil or the like through the use of this linked approach.

In one embodiment, a code is utilized by the telephone, either activates as a single button on the telephone keypad or remote control on a plurality of alphanumeric buttons on the telephone keypad or remote control is utilized as the linkage between the customer and the particular service to be utilized. The code would then allow for user selectable, remote access to goods and services.

Referring now to Figure 13 what is shown is a flow chart of the operation of such an updatable multimedia information system when issuing coupons is viewed by a customer via step 1302 on the television monitor. Thereafter the customer can select from a number of different coupons via step 1304. Thereafter, the MPS generates a coupon order via step 1306. Whether the interactive devices are in a central location or in a each room the customer can order by the device interacting with a catalog order desk located in the facility, via step 1308. The coupon can be provided directly through the account computer of the facility or on the other hand can be provided to the user in the room. That transaction can be completed step via the remote control 900, a interactive device or telephone.

A coupon can then be printed at the front desk through a special printer be delivered via steps 1312. Finally, the coupon could be delivered either to the hotel facilities, to the customers home or to her place of business via step 1314. Finally, there could be variety of methods of delivery and there use would be within the spirit and scope of the present invention.

Referring now to Figure 13A what is shown is an automated call processing system utilized to implement the couponing system of Figure 13. In this embodiment the system places a call to the telephone number of the coupon source via step 1306-1, then the MPS 102 connects to the catalog source via step 1306-2 and send, an automated message such as "You have reached the cable network for ABC hotel, press 1 to confirm." After the connection is confirmed

the MPS 102 it will then send order information to the coupon source via step 1308-1. The source will then acknowledge the order via step 1308-2. The source could for example confirm demographic information and the like during this step.

This system would have particular utility in conjunction with multimedia yellow pages. Hence, the customer can review through advertising typical vendor information as found in the yellow pages except now this information is reviewed from a television. Selections can be made using the remote control 900 to obtain certain information and thereby causing several related actions to occur. By placement of the telephone call a vendor could issue a ticket or coupon for a product or a service. An important feature for the printing of documents is the need for an inventory control system in which the customer can gain access to information that pertains to her transactions.

Referring now to Figures 14a and 14b what are shown is an electronic inventory control system 1400 and a physical inventory control system 1400'. Referring first to Figure 14a the electronic control system includes a personal computer 1402 with an associated display in this case a CRT display 1406. Also coupled to the personal computer is a keypad 1408 and a printer 1404. The printer in turn is coupled to an IMDV output device 1410.

In such a system the keypad 1408 can be utilized by the customer in much the same way as an automatic teller machine (ATM) in which the customer has a security code through the use of a room key to allow the customer to order coupons via the personal computer 1402. The computer is linked to the MPS 102 to allow for secure access to the various sources of information. The display 1406 can be utilized to interactively operate with the personal computer to cause the printing out of the appropriate coupons via the printer 1404. The printer 1404, typically a laser printer or specialized coupon printing machine prints the information and provides that printed coupon information to a secure output device 1410.

Figure 14b has similar elements to Figure 14a, however the physical system includes a tray for receiving the transactional information. Therefore each

customer can have access to an individual tray of information by using their hotel key or the like. Through the inventory control systems shown in Figures 14a and 14b the customer has secure access to interactive multimedia transactions.

It should be understood that the IMD 110 itself could be utilized as a call processing system. Finally, it should be understood that there could be multiple MPS 102 to provide for very large scale call processing through the MPC 109.

The above-described couponing system has significant utility in the linking of couponing information with other information. For example, the coupon can be linked to different categories in the store which in turn can be linked to the inventory in real time. In another example, demographic information or the like can be linked to the receipt of a coupon. In a third example, the issuance of a coupon can be linked to a competitive profile of a user. In this embodiment, the user makes a choice based upon the advertisement presented. A coupon is then generated which is either related to the product advertised or is competitive with that product. In so doing, a fully interactive couponing system is provided.

Finally, this system could be utilized for in store linking. To more particularly describe the advantages of this feature, refer now to Figure 15 which is a store KIOSK in which the user can order the coupon desired. The KIOSK 1500 includes a video screen 1502 with a keyboard 1504 or the like to input the desired information. In a first embodiment, the coupon is code based, that is a customer enters the store and orders a particular coupon or set of coupons based upon a code that he/she enters on the keypad.

In a second embodiment, the coupon is issued based upon an advertisement. The customer would hear and see a particular advertisement prior to the issuance of the coupon. In this embodiment, a particular brand is ordered at the KIOSK 1500 and a coupon is printed that allows for a discount on that brand.

In yet another embodiment, the KIOSK 1500 includes a plurality of food recipes. The user orders a particular recipe via the keyboard and there would be a variety of coupons generated based upon that particular recipe.

This type of in-store couponing system can also be utilized in a store without the KIOSK 1500 described above. For example, the code information for the coupons could be provided directly at the checkout stand. Accordingly, when the customer purchases the appropriate product, the coupon codes or one code representing a plurality of coupons would also be provided directly to the sales person at the check out stand. For example, one code could represent four products. A shopper may order 10 items, that includes three of the four items associated with the code, within the POS system of the store, the coupon values associated with those three items would then be credited utilizing the code, rather than requiring a separate code for each item. In so doing, the coupon information is provided directly at the point of sale (POS).

Although the present invention has been described in accordance with the embodiments shown in the figures, one of ordinary skill in the art recognizes there could be variations to the embodiments and those variations would be within the spirit and scope of the present invention. Accordingly, many modifications may be made by one of ordinary skills in the art without departing from the spirit and scope of present invention, the scope of which is defined solely by the appended claims.

WHAT IS CLAIMED IS:

1. A couponing issuance and tracking system for use in a communication network comprising:

multimedia call processing system (MCPS) responsive to program materials for providing multimedia information;

means interactively responsive to the multimedia call processing system for controlling the flow of multimedia information to the multimedia call processing system;

a plurality of interactive multimedia devices (IMD) for receiving and transmitting multimedia information across the communication network; and

printing means responsive to multimedia information from at least one of the plurality of IMDs for generating coupons.

2. The system of Claim 1 in which the coupon includes encoded information.

3. The system of Claim 2 in which each of the plurality of IMDS devices have the ability to store information related to demographics and the characteristics of the interactive multimedia device and thereafter forward the information to the printing means at an appropriate time.

4. The system of claim 3 in which the coupon is obtained remotely from the system.

5. The system of claim 4 in which a keypad is utilized in conjunction with at least one of the plurality of IMDs to provide for generating the coupons.

6. The system of claim 5 in which the keypad comprises a telephone keypad.

7. The system of claim 5 in which the keypad comprises a remote control keypad.

8. The system of Claim 2 in which the encoded information is utilized for antifraud detection.

9. The system of Claim 2 in which the encoded information is utilized to track demographic information.

10. The system of Claim 3 in which control of the transmission of couponing program material is accomplished using a standard voice response system.

11. The system of Claim 3 in which control of the transmission of couponing program material is accomplished using an interactive voice response system.

12. The system of Claim 3 in which control of the transmission of couponing program material is accomplished using a computer processing system.

13. The system of Claim 3 in which the coupon is linked to inventory of a store.

14. The system of Claim 3 in which the demographic information is linked to the receipt of a coupon.

15. The system of Claim 3 in which the issuance of a coupon is based upon a competitive profile of a product.

16. The system of Claim 3 in which the issuance of a coupon is provided by a facsimile.

17. The system of Claim 3 in which the issuance of a coupon is provided by an IMD coupled to a printer.

18. The system of Claim 3 in which the issuance of a coupon is provided by a KIOSK in a store.

19. The system of Claim 18 in which the KIOSK provides a coupon based upon code provided thereon.

20. The system of Claim 18 in which a coupon is related to advertisement.

21. The system of Claim 20 in which the coupon is produced after seeing the advertisement.

22. The system of Claim 20 in which the coupon is produced after hearing the advertisement.

23. The system of Claim 18 in which the KIOSK provides a plurality of coupons based upon a selected food recipe.

24. The system of Claim 23 which further includes a coupon verifier means coupled to the MCPS for validating the authenticity of the coupon.

25. The system of Claim 24 in which the coupon verifier means includes:

a scanner means for receiving information from the coupon; and

detector means for validating the authenticity of the information on the coupon.

26. The system of Claim 25 in which the detector means includes

means for determining if the coupon is authentic; and

means responsive to the determining means for recording tracking data if the coupon is authentic.

27. The system of claim 1 in which the coupons are generated through the telephone interaction with the MCPS.

28. The system of claim 27 in which the coupons can be provided through a direct mail system through encoded information.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/03137

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G06F 17/60; H04N 7/173
US CL :364/401R; 348/8
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 364/401R, 403, 405, 419.2; 348/6, 7, 8; 235/381, 382, 383

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, &	US, A, 5,488,411 (LEWIS) 30 January 1996; abstract, figures 1-18B; col. 18, lines 64 to col. 19, line 2; col. 20, line 8 to col. 22, line 16	1-28
P, &	US, A, 5,464,946 (LEWIS) 07 November 1995, abstract, figures 1-11; col. 12, line 16 to col. 14, line 54	1-28
&	US, A, 5,325,423 (LEWIS) 28 June 1994, abstract, figues 1-13; col. 15, line 5 to col. 18, line 12	1-28
A,P	US, A, 5,467,269 (FLATEN) 14 November 1995, abstract, figures 1-2, col. 2, lines 27 to col. 3, line 41	5-7, 10-11, 27

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be part of particular relevance

"E" earlier document published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 MAY 1996	24 JUN 1996

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Form PCT/ISA/210 (second sheet)(July 1992)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/03137

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 5,249,044 (VON KOHORN) 28 September 1993, abstract, figures 1-7, col. 3, lines 10-12 & 22-25; col. 4, lines 43 to col. 7, line 18; col. 11, line 25 to col. 13, line 23	2-4, 8-17, 19-26
A	US, A, 5,237,157 (KAPLAN) 17 August 1993, abstract, figures 1-2, col. 4, line 19 to col. 6, line 47	3, 9, 12-13, 15, 18, & 20-22
A	US, A, 5,056,019 (SCHULTZ ET AL) 08 October 1991, abstract, figures 1-2, col. 6, line 39 to col. col. 10, line 52	2-4 & 8-26

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/03137

B. FIELDS SEARCHED
Electronic data bases consulted (Name of data base and where practicable terms used):

APS

search terms: multimedia, television, coupon, printer, telephone, voice response, advertisement